NASA
CR
3133-
v.2
c.1

TECH LIBRARY KAFB, NM
0061803

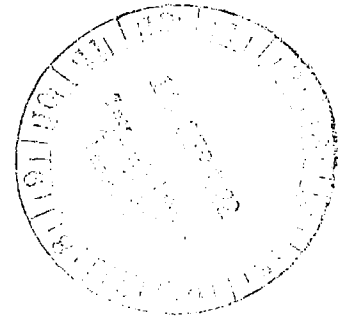
NASA Contractor Report 3588

Nonmetallic Materials Handbook

Volume 2 - Epoxy and Silicone Materials

Stanley E. Podlaseck

CONTRACT NAS1-15133
JULY 1982



NASA

TECH LIBRARY KAFB, NM
0061803

NASA Contractor Report 3588

Nonmetallic Materials Handbook

Volume 2 - Epoxy and Silicone Materials

Stanley E. Podlaseck
Stanley E. Podlaseck
Lompoc, California

Prepared for
Langley Research Center
under Contract NAS1-15133

National Aeronautics
and Space Administration

Scientific and Technical
Information Office

1982

Table of Contents

Page

1. Tests vi

2. Material Test Index viii

3. Application Index xiii

4. Introduction. 1

5. Discussion of Test Methods

 I. Thermochemical Tests. 2
 II. Physical Property Tests 8
 III. Qualification Criteria for Viking Materials 10

6. Data Section

Material	Manufacturer	
Epoxy		
Ablebond 113-4	Ablestik Labs	15
Ablestik 184-1	Ablestik Labs	18
Bacon Coil Impregnant No. 6	Bacon Industry, Inc.. . . .	21
C-93 Epoxy/Glass/Silver/Copper	Frank Matson.	24
Cat-L-Ink 50-700, Black	Wornow Process Paint. . . .	27
Cat-A-Lac (Black) 463-3-8	Finch Paint Co.	30
Eccobond 57C	Emerson & Cuming, Inc.. . .	33
Epiall 1961	Allied Chem. Corp..	36
Epoxy DE-8501	Di-Ene Products	39
Epoxy K762	Martin Marietta	42
Hexabond HB 6831	Hexcel Corp..	45
Hexcel F161	Hexcel Corp..	48
Hysol C7-4247	Hysol	50
Ink, M-4-N/Cat. A	Wornow Process Paint. . . .	53
Ink, M-O-N/Cat. A	Wornow Process Paint. . . .	56
Mica B-Stage 102-18	Mica Corp..	59
P527 Primer	Bacon Industry, Inc.. . . .	61
Scotchcast XR-5068 Electrical Insulation	3M Co..	63
Scotchcast 243 Encapsulant	3M Co..	65
Wornow Ink, Blue, Cat. 20	Wornow Process Paint. . . .	67
Wornow Ink, Orange, Cat. 20	Wornow Process Paint. . . .	70
Silicone		
Aluminized Silicone Coating	Dexter Midland.	73
Cho-Seal 1030	Chomerics, Inc.	76
Cho-Seal 1030 with Chomerics Primer	Chomerics, Inc.	79

		Page
Cho-Seal 1224	Chomerics, Inc.	82
Cho-Seal 1250	Chomerics, Inc.	89
Cho-Seal 1250 with Chomerics Primer	Chomerics, Inc.	92
Consil Technit EMI/RFI Shielding Gasket	Technit	95
DC-11 Silicone Grease	Dow Corning Corp.	97
DC-33 Silicone Grease, Light	Dow Corning Corp.	100
DC-33 Silicone Grease, Medium	Dow Corning Corp.	103
DC-340 Silicone Grease	Dow Corning Corp.	106
DC-372 Tubing	Dow Corning Corp.	108
DC-997 Silicone Varnish	Dow Corning Corp.	111
DC-1203 Primer	Dow Corning Corp.	113
DC-3116 Encapsulant	Dow Corning Corp.	115
DC6-1102 Sealant	Dow Corning Corp.	118
DC6-1103 Lubricant	Dow Corning Corp.	120
DC6-1104 Sealant	Dow Corning Corp.	123
DC6-1106 Sealant	Dow Corning Corp.	136
DC69-220 Potting Compound	Dow Corning Corp.	139
DC92-007 Coating	Dow Corning Corp.	132
DC92-007 Gloss Gray Coating	Dow Corning Corp.	137
DC92-009 Black Coating	Dow Corning Corp.	140
DC93-072 A/B	Dow Corning Corp.	143
DC93-076 A/B	Dow Corning Corp.	146
DC93-076 A/B	Dow Corning Corp.	149
DC93-076 Type I	Dow Corning Corp.	152
DC93-500 Sealant	Dow Corning Corp.	155
E058R Elastomer	Lord Mfg.	158
Gray Silicone Coating	Martin Marietta	161
Heat Shield Joint Sealant JS-220	Martin Marietta	163
MS40G08	Moxness Products, Inc.	166
MS50S14	Moxness Products, Inc.	169
Nash M9810 Terminal, Silicone/Glass	Nash.	172
Permacel Tape with Silicone Adhesive	Permacel.	174
RTV-511, Modified	General Electric Co.	176
RTV-560	General Electric Co.	179
RTV-566 A/B	General Electric Co.	182
RTV-566 A/B	General Electric Co.	185
RTV-566/SS4155 Primer	General Electric Co.	188
RTV-567 A/B	General Electric Co.	191
RTV-8111 Silicone Elastomer	General Electric Co.	194
RTV-8111 Silicone Elastomer	General Electric Co.	197
RTV-8111 Silicone Elastomer	General Electric Co.	200
RTV-82621, RTV-83831/Cat. 9858	General Electric Co.	203
S-383-70 Elastomer	Parker Seal	206

		Page
S-469-40 Elastomer	Parker Seal	209
S-469-40 Elastomer	Parker Seal	212
S-469-40 Elastomer	Parker Seal	214
S-469-40 Elastomer	Parker Seal	217
S-469-40 Elastomer	Parker Seal	220
S-595-50 Elastomer	Parker Seal	223
S-1669 Elastomer	Goshen Rubber	226
SE-5211 Elastomer	Reeves Rubber	229
Silicone Blanket Laminate 4425051-9033	PSM Corp.	232
Silicone Heater Blanket 101-103	Electroflex	235
Silicone Heater Blanket 101-103	Electroflex	237
Silicone Seal Assembly P/N5722013-101	Coastcraft.	240
Silicone Seal Assembly, P/N5722013-101, Rev. C	Coastcraft.	243
Silicone Silver Paint, STM K756	Martin Marietta	246
Silicone Sponge Rubber, CHR-R-10470	Conn. Hard Rubber	249
Silicone Tape, Series 600	Borden.	252
SV92-RER Silicone Molding	Dale Resistor	255
SV92-RWR Silicone Encapsulant	Dale Resistor	258
940-C-1776 Elastomer	Kirkhill Rubber Co.	261
950-C-1483 Elastomer	Kirkhill Rubber Co.	264
950-C-1569 Elastomer	Kirkhill Rubber Co.	267
950-C-2491 Elastomer	Kirkhill Rubber Co.	270
960-C-1561 Elastomer	Kirkhill Rubber Co.	273
970-C-1562 Elastomer	Kirkhill Rubber Co.	276
595-S Elastomer	Parker Seal	279
11054 Elastomer	Precision Rubber Co.	282
405290 Elastomer	W. Am. Rubber Co.	285
7X933 Black Paint	3M Co.	288
ZP5044 Elastomer	Zero Mfg.	291

TESTS

1.	Vacuum TGA	V70/23P
2.	Mass spectra of volatiles	V70/23P
3.	Nitrogen TGA	V70/23P
4.	DTA	V70/23P
5.	Isothermal weight loss in nitrogen	V70/22P
6.	Vacuum condensables	V70/22P
7.	Corona resistance	ASTM D1868
8.	Dielectric strength	ASTM D149
9.	Dielectric constant	ASTM D150; ASTM 1673
10.	Dissipation factor	ASTM D150
11.	Insulation resistance	ASTM D257
12.	Surface and volume resistivity	ASTM D257
13.	Adhesion	FTMS 141 Method 6304.1
14.	Bearing strength	FTMS 406 Method 1051
15.	Bend test	FTMS 141 Method 6304.1
16.	Compression set	ASTM D395
17.	Compression strength	ASTM D695; ASTM 1621; ASTM C165
18.	Creep	ASTM D674
19.	Dimensional stability	ASTM C548; ASTM C356
20.	Emissivity and absorptivity	V71/96P; V71/97P
21.	Flexibility	FTMS 141 Method 6221
22.	Flexure	ASTM D790
23.	Hardness	FTMS 601 Method 3021 ASTM D785 and D2240
24.	Lap Shear	ASTM D1002
25.	Moisture resistance	ASTM D570
26.	Peel	ASTM D1876
27.	Knot breaking strength	(MMC) STM F420
28.	Scratch	FTMS 141 Method 6304.1
29.	Solvent resistance	ASTM D471
30.	Specific gravity	ASTM D792

Tests (Cont'd)

31.	Tear	ASMT D624
32.	Tensile	ASTM D412; ASTM D638 FTMS 191 Method 4102
33.	Thermal conductivity	ASTM C177
34.	Thermal expansion	ASTM D696
35.	Water absorption	FTMS 406 Method 7031

Material Test Index

NAME	TESTS PERFORMED*																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Ablebond 113-4	X	X																																	
Ablestik 184-1	X	X																																	
Bacon Coil Impregnant No. 6	X	X																																	
C-93 Epoxy/Glass/ Silver/Copper	X	X																																	
Cat-L-Ink 50-700, Black	X	X																																	
Cat-A-Lac, Black, 463-3-8	X	X																																	
Eccobond 57C	X	X																																	
Epiall 1961	X	X																																	
Epoxy DE-8501	X	X																																	
Epoxy K762	X	X																																	
Hexabond HB 6831	X	X																																	
Hexcel F161	X	X																																	
Hysol C7-4247	X	X																																	
Ink, M-4-N/Cat. A	X	X																																	
Ink, M-O-N/Cat. A	X	X																																	
Mica B-Stage 102-18	X	X																																	
P527 Primer	X	X																																	
Scotchcast XR-5068 Electrical Insulation	X	X																																	
Scotchcast 243 Encapsulant	X	X																																	
Wornow Ink, Blue, Cat. 20	X	X																																	
Wornow Ink, Orange, Cat. 20	X	X																																	

*Numbers refer to tests listed on pp. vi and vii.

Material Test Index

NAME	TESTS PERFORMED*																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Aluminized Silicone Coating	X	X		X																															
Cho-Seal 1030	X	X																																	
Cho-Seal 1030 with Chomerics Primer	X	X																																	
Cho-Seal 1224	X	X	X		X	X					X					X							X								X				
Cho-Seal 1250	X	X																																	
Cho-Seal 1250 with Chomerics Primer	X	X																																	
Consil Tecknit EMI/RFI Shielding Gasket	X	X																																	
DC-11 Silicone Grease	X	X																																	
DC-33 Silicone Grease, Light	X	X																																	
DC-33 Silicone Grease, Medium	X	X																																	
DC-340 Silicone Grease	X	X																																	
DC-372 Tubing	X	X																																	
DC-997 Silicone Varnish	X	X																																	
DC-1203 Primer	X	X																																	
DC-3116 Encapsulant	X	X																																	
DC6-1102 Sealant	X	X			X	X																													
DC6-1103 Lubricant	X	X																																	
DC6-1104 Sealant	X	X																																	
DC6-1106 Sealant	X	X	X		X	X																													

*Numbers refer to tests listed on pp. vi and vii.

Material Test Index

NAME	TESTS PERFORMED*																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
DC69-220 Potting Compound	X	X																																	
DC92-007 Coating	X	X																																	
DC92-007 Gloss Gray Coating	X	X			X	X																													
DC92-009 Black Coating	X	X																																	
DC93-072 A/B	X	X																																	
DC93-076 A/B	X	X																																	
DC93-076 A/B	X	X																																	
DC93-076 Type I	X	X																																	
DC93-500	X	X						X	X																										
E058R Elastomer	X	X																																	
Gray Silicone Coating	X	X			X	X																													
Heat Shield Joint Sealant JS-220	X	X			X																														
MS40G08	X	X			X	X																													
MS50S14	X	X																																	
Nash M9810 Terminal, Silicone/Glass	X	X																																	
Permacel Tape with Silicone Adhesive	X	X																																	
RTV-511, Modified	X	X	X	X	X	X																													
RTV-560	X	X																																	
RTV-566 A/B	X	X																																	
RTV-500 A/B	X	X																																	
RTV-566/SS4155 Primer	X	X																																	
RTV-567 A/B	X	X																																	

*Numbers refer to tests listed on pp. vi and vii.

Material Test Index

NAME	TESTS PERFORMED*																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
RTV-8111 Silicone Elastomer	X	X																																	
RTV-8111 Silicone Elastomer	X	X																																	
RTV-8111 Silicone Elastomer	X	X																																	
RTV-81621,RTV-83831/ Cat. 9858	X	X																																	
S-383-70 Elastomer	X	X		X																															
S-460-40 Elastomer	X	X		X	X																														
S-469-40 Elastomer	X	X																																	
S-469-40 Elastomer	X	X																																	
S-469-40 Elastomer	X	X																																	
S-469-40 Elastomer	X	X																																	
S-1669 Elastomer	X	X																																	
SE-5211 Elastomer	X	X																																	
Silicone Blanket Laminate 4425051-9033	X	X																																	
Silicone Heater Blanket 101-103	X	X		X																															
Silicone Heater Blanket 101-103	X	X																																	
Silicone Seal Assembly P/N5722013-101	X	X																																	
Silicone Seal Assembly P/N5722103-101,Rev.C	X	X																																	
Silicone Silver Paint, STM K756	X	X																																	

*Numbers refer to tests listed on pp. vi and vii.

Material Test Index

NAME	TESTS PERFORMED*																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Silicone Sponge Rubber, CHR-R-10470	X	X																																	
Silicone Tape, Series 600	X	X																		X															
SV92-RER Silicone Molding	X	X																																	
SV92-RWR Silicone Encapsulant	X	X																																	
940-C-1776 Elastomer	X	X																																	
950-C-1483 Elastomer	X	X																																	
950-C-1569 Elastomer	X	X																																	
950-C-2491 Elastomer	X	X																																	
960-C-1561 Elastomer	X	X																																	
970-C-1562 Elastomer	X	X																																	
595-S Elastomer	X	X																																	
11054 Elastomer	X	X																																	
405290 Elastomer	X	X																																	
7X933 Black Paint	X	X																																	
ZP5044 Elastomer	X	X																																	

*Numbers refer to tests listed on pp. vi and vii.

Application Index

Page

Adhesives:

Ablebond 113-4 15
Ablestik 184-1 18
DC93-076 A/B 146
DC93-076 A/B 149
DC93-076 Type I. 152
Eccobond 57C 33
Epiall 1961. 36
Hexabond HB 6831 45
RTV-560. 179
RTV-566 A/B. 182
RTV-566 A/B. 185
RTV-566/SS4155 Primer. 188
RTV-567 A/B. 191

Elastomers:

Cho-seal 1030. 76
Cho-Seal 1030 with Chomerics Primer. 79
Cho-Seal 1224. 82
Cho-Seal 1250. 89
Cho-Seal 1250 with Chomerics Primer. 92
Consil Tecknit EMI/RFI Shielding Gasket. 95
DC-372 Tubing. 108
DC93-072 A/B 143
E058R Elastomer. 158
MS40G08. 166
MS50S14. 169
RTV-8111 Silicone Elastomer. 194
RTV-8111 Silicone Elastomer. 197
RTV-8111 Silicone Elastomer. 200
S-383-70 Elastomer 206
S-469-40 Elastomer 209
S-469-40 Elastomer 212
S-469-40 Elastomer 214
S-469-40 Elastomer 217
S-469-40 Elastomer 220
S-595-50 Elastomer 223
S-1669 Elastomer 226
SE-5211 Elastomer. 229
Silicone Heater Blanket 101-103. 235
Silicone Heater Blanket 101-103. 237

Page

Silicone Seal Assembly P/N5722013-101. 240
Silicone Seal Assembly P/N5722013-101, Rev. C. 243
Silicone Sponge Rubber, CHR-R-10470. 249
940-C-1776 Elastomer 261
950-C-1483 Elastomer 264
950-C-1569 Elastomer 267
950-C-2491 Elastomer 270
960-C-1561 Elastomer 273
970-C-1562 Elastomer 276
595-S Elastomer. 279
11054 Elastomer. 282
405290 Elastomer 285
ZP-5044 Elastomer. 291

Potting Compounds and Encapsulants:

Bacon Coil Impregnant No. 6. 21
Hysol C7-4247. 50
Scotchcast 243 65
DC-3116 Encapsulant. 115
DC69-220 Potting Compound. 129
SV92-RER Silicone Molding. 255
SV92-RWR Silicone Encapsulant. 258

Coatings, Finishes, Inks:

Aluminized Silicone Coating, Dexter-Midland. 73
Cat-L-Ink,50-700, Black. 27
Cat-A-Lac (Black) 463-3-8. 30
DC-1203 Primer 113
DC-997 Silicone Varnish. 111
DC92-007 Coating 132
DC92-007 Gloss Gray Coating. 137
DC92-009 Black Coating 140
Epoxy DE-8501. 39
Epoxy K762 43
Gray Silicone Coating. 161
Ink, M-4-N/Cat. A. 53
Ink, M-O-N/Cat. A. 56
P527 Primer. 61
Wornow Ink, Blue, Cat. 20. 67
Wornow Ink, Orange, Cat. 20. 70
RTV-511, Modified. 176
Silicone Silver Paint, STM K756. 246
7X933 Black Paint. 288

Page

Laminates:

C-93 Epoxy/Glass/Silver/Copper 24
Hexcel F161. 48
Mica B-Stage 102-18. 59
Silicone Blanket Laminate 4425051-9033 232
RTV-82621, RTV-83831/Cat. 9858 203

Lubricants:

DC-11 Silicone Grease. 97
DC-33 Silicone Grease, Light 100
DC-33 Silicone Grease, Medium. 103
DC-340 Silicone Grease 106
DC6-1103 Lubricant 120

Sealants:

DC6-1102 Sealant 118
DC6-1104 Sealant 123
DC6-1106 Sealant 126
DC93-500 Sealant 155
Heat Shield Joint Sealant JS-220 163

Tapes:

Permacel Tape with Silicone Adhesive 174
Silicone Tape, Series 600. 252

Miscellaneous:

Scotchcast XR-5068 Electrical Insulation 63
Nash M9810 Terminal, Silicone/Glass. 172

INTRODUCTION

This handbook is a compilation of chemical and physical property test data obtained during qualification and receiving inspection testing of nonmetallic materials for the Viking Mars Lander (NAS1-9000) program at the Denver Division of Martin Marietta Corporation. The compilation presented here is unique in that all tests have been carried out by one group of test personnel. This familiarity with all test procedures and materials minimizes the possibility of unintentional modifications of test techniques and misinterpretation of data and their presentation.

The information presented has, as a minimum, thermochemical data showing degradation as a function of temperature from room temperature through 773 K (500°C). These data include activation energies for thermal degradation, rate constants, and exo- and/or endotherms. Thermal degradations carried out under vacuum include mass spectral data taken simultaneously during the decomposition. Many materials have supporting data such as condensation rates of degassed products and isothermal weight loss. Changes in mechanical, electrical and thermal properties after exposure to 408 K (135°C) in nitrogen for times ranging from 380 to 570 hours are included for many materials.

Over 400 organic/polymeric materials were considered for use throughout the Viking Mars lander capsule program. Considering the variety of mechanical, electrical and thermal property measurements required, conventional vacuum tests techniques would be prohibitive from the standpoint of both cost and schedule. Unique facilities for determining physical properties in-situ were developed to handle the environmental exposure and material qualification test requirements established for the Viking Mars lander capsule. Since the capsule was almost completely inactive during cruise from Earth to Mars and few mechanical or electrical stresses are developed during this phase, the thermal vacuum environment was the only simulation required. The system developed separated the environmental conditioning from testing and provided for transfer of specimens between conditioning and testing chambers without exposure to atmosphere. It is described later.

DISCUSSION OF TEST METHODS

I. Thermochemical Data

A. TGA: Thermogravimetric analysis (TGA) is the continuous weighing of a sample while it is being heated at a fixed heating rate, e.g., 10 K/min. During this process, the sample loses weight continuously, beginning and ending at temperatures peculiar to the sample material. Figure 1 is a schematic of the system used.

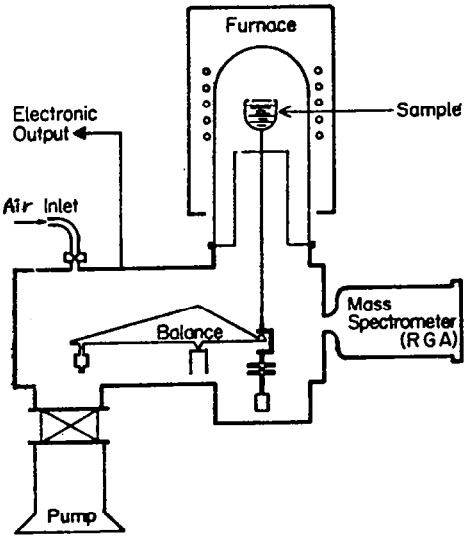


Figure 1
Schematic of TGA-RGA Apparatus

Figure 2 shows the TGA curve for a silicone. This material thermally decomposes in a two-step process; the dotted line depicts the end of the first reaction. The second reaction may be the decomposition of the product of the first reaction or it may be different component of the original material.

The simple first-order kinetic equation

$$\frac{dx}{dt} = \frac{k_T}{(a_o - x)} \qquad (1)$$

has been found to be adequate for describing the decompositions. In this equation, k_T is the rate constant at temperature T, dx/dt is the rate of weight loss, x is the weight loss, and a_o is the initial amount of the "active component". The active component is that portion of the original weight of the sample that participates in decomposition. For decompositions with a simple TGA curve, the active component is taken as the total weight loss. For polymers where the TGA shows the degradation to be more than a one-step decomposition as in Figure 2, the initial weight of the active component a_o is taken as that portion of sample weight participating in the step. In Figure 2, these are designated as $(a_o)_1$ for the first de-

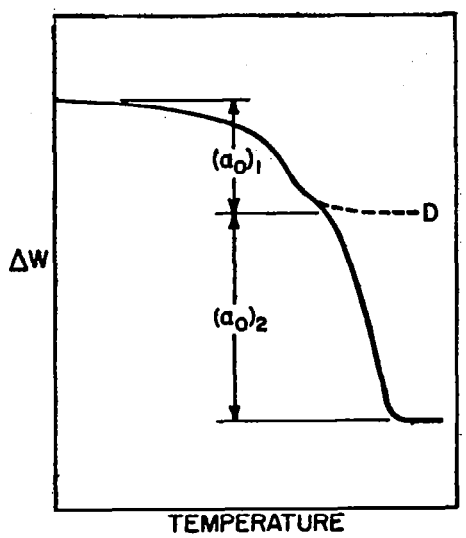


Figure 2
TGA Curve for a Silicone

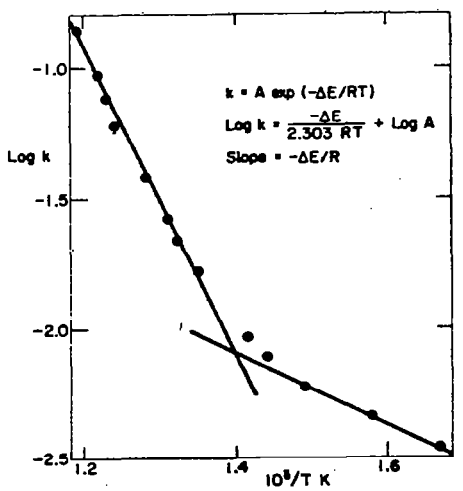


Figure 3
Arrhenius Relationship
Obtained from TGA Curve

composition and $(a_o)_2$ for the second step. In utilizing equation (1), the thermoanalyzer yields dx/dt from the DTG output, which is the electronically determined slope of the TGA, x is obtained from the TGA curve, and a_o as described.

The rate constant is given by the "Arrhenius relationship"

$$k = A \exp \frac{-E}{(RT)\ \text{time}^{-1}} \qquad (2)$$

where A is a constant, usually called the frequency factor, R is the universal gas constant, T is the absolute temperature, and E is an energy term known as the activation energy of the process. If the rate constants, experimentally determined at several temperatures, from Equation (1) are plotted against the reciprocal of absolute temperature (K), the result is the Arrhenius relationship depicted in Figure 3. The slope of this plot yields the activation energy of the decomposition. Figure 3 shows the results obtained for the first reaction step of the decomposition for the silicone depicted in Figure 2. The points on the plot are representative of the very large number of data points available from the TGA-DTG output of the thermoanalyzer. The larger slope is the activation energy for the decomposition of the polymer associated with $(a_o)_1$. The smaller slope results from degassing of "solvent" such as unreacted monomer, catalyst,

etc. At the lower temperatures of the TGA test where this slope appears, x in Equation (1) is predominantly "solvent" loss whereas the amount of "solvent" is so small with respect to the amount of polymer that it does not affect a_o for the polymer degradation. Thus, when the "solvent" is degassed during the early stages of the TGA test, the Arrhenius relationship reverts to that for the degradation of the polymer itself.

Integration of the rate equation, Equation (1), yields

$$a_o - x = a_o e^{-kt} \tag{3}$$

where t is time. Then

$$\frac{a_o - x}{a_o} = e^{-kt} \text{ is the fraction remaining.} \tag{4}$$

Thus, when k is determined for a particular temperature, one can get the fraction of material remaining after a time, t,

$$1 - e^{-kt} \times 100 = \% \text{ weight loss.} \tag{5}$$

As an example consider the question, what is the time required for a 1% weight loss at 423 K (150°C) for a silicone such as that depicted in Figure 2? From information given for the material in the Data Section, we find that

$$k_T = 0.8 \exp \frac{-6720}{(RT\ K)} \ \text{min}^{-1}$$

Therefore

$$k_{423\ K\ (150^oC)} = 0.8 \exp \frac{-6720}{(1.98 \times 423)} = 2.63 \times 10^{-4}\ \text{min}^{-1}.$$

For 1% weight loss, the fraction remaining is 0.99 so e^{-kt} =

0.99, from which we find that kt = 0.01. Thus the time required is

$$t = \frac{0.01}{2.63 \times 10^{-4}} = 38 \text{ min.} = 2.3 \times 10^{3} \text{ s.}$$

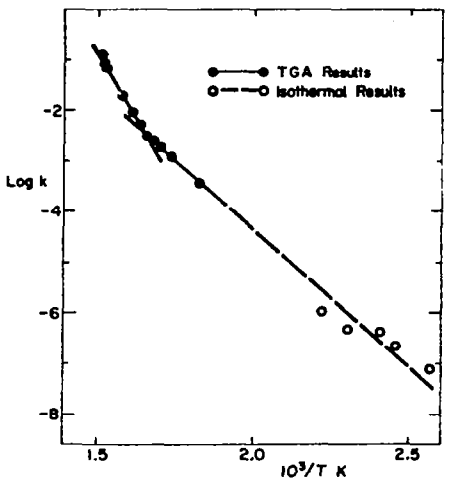


Figure 4
Arrhenius Relationship Comparing TGA and Isothermal Results for Dacron

Figure 4 compares TGA results on approximately 10 mg of Dacron parachute material with an isothermal decomposition on approximately 4 gm of material at near normal use temperatures. The excellent agreement with the prediction of TGA is evident. It should be noted that the TGA is able to predict rate constants at some 300 K lower temperature on realistically sized samples. Predictive capability has been found for all materials so compared (see "Prediction of Polymer Degradation Kinetics at Moderate Temperatures from TGA Measurements", H. Papazian, J. Appl. Polym. Sci., 16, 2503, 1972).

When the cure and postcure of two different batches of the same polymer are carried out in the same manner, the TGA curves are identical.

TGA tests were run at heating rates of 10 K/min for both the vacuum and nitrogen tests. Samples were prepared as small particles scraped or cut to size to approximately 10 mg of total weight. Samples were preconditioned prior to TGA tests in several ways and are discussed for each material in the data section. For the nitrogen TGA tests, the flow rate of the nitrogen was 5.2 l/hr. During vacuum TGA tests, mass spectra were taken at 1-minute intervals (i.e., every 10 K).

The TGA data in this document are presented in graphical form, similar to Figure 2, giving weight loss vs. temperature from ambient to 773 K (500°C). A second curve having 10 times the sensitivity of the standard TGA curve is used to give an

accurate display of the first 10% of weight loss. This will give details of the early portion of the decomposition, which may be of importance in determining low temperature degassing, water absorption, etc.

B. Mass Spectra - Mass spectrometry, sometimes referred to as residual gas analysis (RGA) or evolved gas analysis (EGA), has been used to qualitatively characterize the volatile species as they are generated during the TGA test.

When a volatilized molecule enters the ionization chamber (or region) of a mass spectrometer, it is impacted by energetic (70-eV) electrons. The molecule is thereby fragmented into its mass spectrum. This mass spectrum is characterized by masses and their intensities. For example, H_2O is fragmented into masses 18 (H_2O+), 17 (OH+), 16 (O+) in the intensity ratio 18 = 100, 17 = 26, 16 = 6. Whenever a mass spectrum is observed with the masses 18, 17, and 16 in the intensity ratio 100, 26, and 6, it may be identified as water.

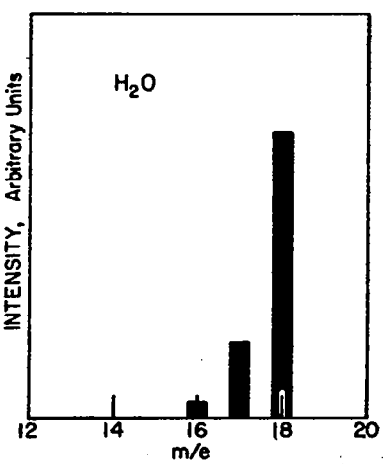


Figure 5
Mass Spectrum of Water

Figure 5 depicts the mass spectrum of H_2O obtained with 70-eV electrons. The abscissa is labeled m/e to be consistent with the usual presentations. The ratio of mass-to-charge, m/e, is what is actually measured in the mass spectrometer. Since it is unusual for the charge e to be equal to 2, the m/e ratio is usually the mass number or mass fragment. For simple molecules the analysis is quite simple. With increasing molecular weight and therefore increasing complexity of the molecule, the complexity increases accordingly. In mixtures of such molecules, as are present in most polymeric systems, the analysis is exceedingly difficult. However, mass spectra used in conjunction with TGA data permit determination as to whether samples from two different batches are identical. This permits comparison of materials and how they were processed.

Mass spectra can also be useful in determining degassing prior to thermal decomposition. For example, one can determine

how much H_2O, solvent, unreacted monomer, etc., remain in the material after processing, e.g., cure, postcure.

On all TGA tests under vacuum, mass spectra are taken at 1-minute intervals, i.e., every 10 K. Since it is impractical to present these voluminous data, approximately five temperatures are chosen along important parts of the TGA curve and mass spectra at these temperatures are presented in tabular form.

C. DTA: Differential thermal analysis (DTA) indicates the heat changes taking place during the decomposition. An exotherm indicates a release of heat, and an endotherm indicates the absorption of heat. This information is useful in determining the mechanism of the decomposition reaction.

DTA curves are obtained simultaneously with the TGA under nitrogen and are presented in graphical form for each material.

D. Isothermal Weight Loss in Nitrogen: The purpose of this test was to simulate the Viking lander sterilization conditions.

Samples were preconditioned for 24 hours at 296 K (23°C) in 45% RH for a baseline condition. Approximately 2 to 5 gm of sample was weighed and placed in a gastight system at 408 K (135°C). Nitrogen flowing at 5.2 l/hr. was passed over the sample for 100 hrs. (3.6×10^5s) after which the sample was weighed to determine the weight loss.

E. Condensible Outgassing: In many situations it is important to know what products of outgassing from a material are condensible, thereby leading to contamination of, for example, optical surfaces.

Condensible degassing rates onto a gold-plated quartz substrate cooled to 148 K (-125°C) were determined using a quartz crystal microbalance (QCMB). In this test, a 2 to 5 gm sample was placed in a small vacuum furnace and the temperature was elevated to 325 K (52°C) (max mass lander temperature anticipated). The furnace was then sealed except for a small orifice above which the cooled QCMB was located. The condensation rate was monitored continuously until a constant deposition rate was established, the time ranging from 1 to 4 days.

Figure 6 is a schematic diagram of the test apparatus.

The results are presented in tabular form showing condensation rate (as % of original sample weight per day),

temperature of the sample, and the duration of vacuum exposure prior to outgassing tests.

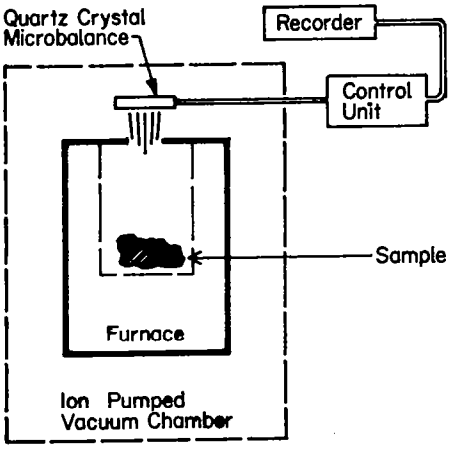


Figure 6
Schematic of Condensible Outgassing Products

II. Physical Property Tests

Twenty-nine different physical properties have been measured, each material being tested for its particular use. These tests are listed in Table 1 on Pages iv and v. Points at which property determinations were made include before and after heat compatibility and after a 1-month thermal vacuum exposure, with some data at 3-, 6-, and 14-month thermal vacuum exposures. The results for any material are presented in tabular form showing the property measured against the parameter of interest and the ASTM or FTMS designation for the test procedure.

The thermal vacuum exposures were carried out in individual canisters. Four canisters were coupled directly to 50 l/s ion pumps and the remaining 28 were connected to 7-canister plenums, with each plenum attached to a 400 l/s ion pump. Each system was capable of maintaining pressures in the 10^{-7} to 10^{-8} torr range.

Two 63.5 mm high vacuum valves between the canister and vacuum plenum permitted the canister to be removed from the pumping system and transferred to the test chamber without altering the pressure in the canister or plenum. A recirculating hot water heater maintained canister temperatures between ambient and 339 K (66°C).

The test chamber was constructed of 300 series stainless steel and consisted of two individual vacuum chambers separated by a .61 m sliding gate valve. The main chamber was a nominal 1.5 m in diameter and 2.1 m long. The airlock chamber was .61 m in diameter and .61 m long, and a full opening door at the other end provided easy access to the chamber.

The .56 m^2 chamber view window had three tempered glass

sections each laminated of two layers of 19 mm thick glass. Twenty-nine flanges on the main chamber ranged in size from a 38 to 203 mm tube size. The flanges were fitted with feedthroughs for high voltage, coaxial, high current, instrumentation, liquid nitrogen, and nude ion gages.

Three master/slave manipulators enabled access to over 90% of the chamber while it was evacuated. The manipulators were similar to those used in nuclear installations and each consisted of four major parts--the master arm, the slave arm, the seal tube assembly, and the tongs. Tong configurations could be changed remotely using a special fixture. The manipulators provided six degrees of freedom and had electric indexing in two axes for displacement of the master arm relative to the slave arm. All other motions were mechanical, with a one-to-one force ratio between the master arm and the slave arm except for the friction of the motion rods within the seal tube assembly. Figure 7 shows the chamber and manipulators.

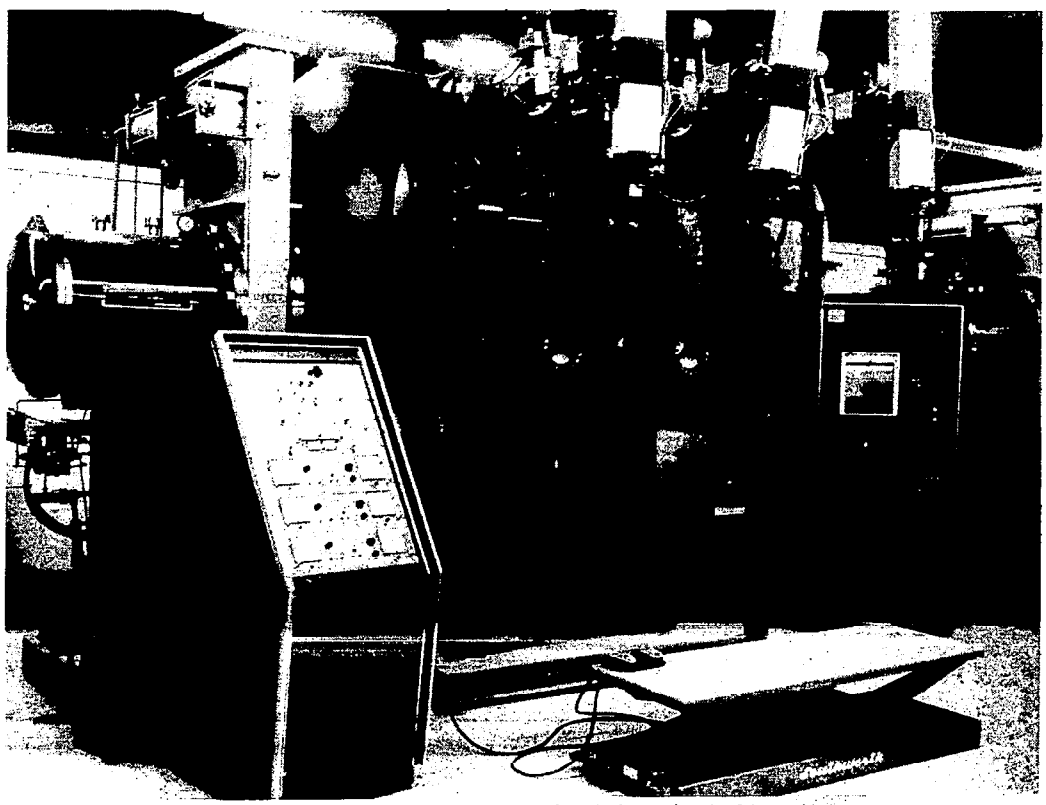


Figure 7.-Master-Slave Manipulator Test Chamber.

A 4,500 kg universal test machine was coupled to the main chamber. The columns were shock isolated from the chamber with bellows, and the moving crosshead pull rod was attached to a bellows with a 35 cm stroke capability. Tensile, compression, flexure, and shear tests have been performed in this chamber. Electrical property tests, including dielectric strength, dielectric constant, and surface and volume resistivity, have been accomplished with the aid of special fixturing developed for use in vacuum with the master/slave manipulators. Thermal expansion measurements of heat shield materials have been made using fixtures designed to be handled with manipulators. Heating and cooling of test specimens was provided by radiant heaters (quartz lamps) and liquid nitrogen-cooled shrouds.

III. Qualification Criteria Used for Viking Materials

All proposed materials were given a screening TGA. There were no criteria for this test except judgment as to thermal stability. This judgment was based on how much weight loss occurred at the sterilization temperature and the temperature of the beginning of major decomposition of the material.

Once a material passed screening, qualification of the material for the Viking program was undertaken. The material was subjected to tests of (1) isothermal weight loss in N_2 and (2) condensible outgassing. If the isothermal weight loss was greater than 1%, the material was rejected. If the condensible outgassing rate was greater than 1×10^{-4}%/day, the material was rejected. If the material passed these criteria, it was permitted to undergo the physical property qualification tests that depended on the proposed use of the material. The criteria for the physical property qualification were determined by the design parameters for the material.

A TGA-RGA analysis was carried out as a baseline for comparison with all subsequent lots or batches of material. Rejection of an incoming sample occurred if:

1) The TGA curve of the new sample presented a total mismatch with the baseline curve;

2) The TGA weight loss in the temperature range between 298 K (25°C) and 408 K (135°C) was more than 2% of the baseline TGA;

3) The RGA data showed major mass fragments different from

the baseline major mass fragments;

4) The RGA data between 298 K (25°C) and 408 K (135°C) showed mass fragments greater than m/e = 44 not present in the baseline RGA;

5) When the onset of major degradation varies more than 50 to -20 K from the baseline onset;

6) When the total weight loss (through major degradation) of composites indicates a filler content variation of greater than 5%.

During the course of the program changes in technical direction eliminated or modified some qualification tests so that not all materials reported here have the same data available.

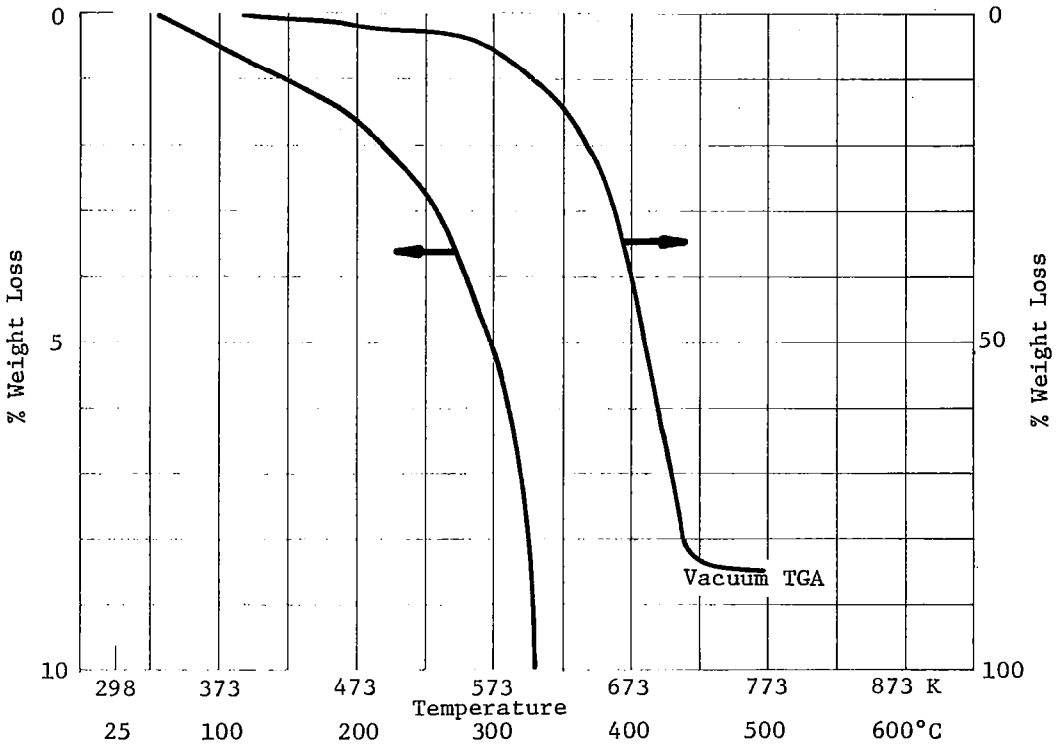
Use of trade names or names of manufacturers in this report does not constitute an official endorsement of such products or manufacturers, either expressed or implied, by the National Aeronautics and Space Administration, nor does it imply that the materials are necessarily the only ones or the best ones available for the purpose.

DATA SECTION

Chemical Characterization Summary

Mix Ratio: 70 pbw Resin to 45 pbw Activator
Cure: 1 hr. at 366 K (90°C)

1. TGA Preconditioning: 24 hrs. at 296 K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523 K (250°C) - 723 K (450°C)

a_o = 95% of initial weight

$$k = 2.8 \times 10^{15} \exp\left(\frac{-37{,}900}{1.98\ T\ K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323 K (50°C)	1.2×10^{11}	
373 K (100°C)	4.1×10^{6}	
423 K (150°C)	9.6×10^{3}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Ablebond 113-4

m/e	298 (25)	523 (250)	623 (350)	723 (450)			
14	1248	1595	3396	3103			
15	464	1409	7003	5351			
16	4743	5273	9855	7266			
17	18800	22836	35089	22541			
18	64816	71932	100000	66375			
19	70	119	236	288			
20	343	454	546	583			
21							
22							
23							
24		43	441	480			
25		146	1937	1966			
26	202	1357	11630	10446			
27	676	1830	14508	16857			
28	23968	26653	49834	44339			
29	313	2066	10678	10968			
30	1050	1507	9700	3121			
31	85	159	2074	1001			
32	5389	5165	6389	5694			
33			51	59			
34							
35							
36			248	382			
37		69	1817	2456			
38		181	3602	5228			
39	59	527	10612	20874			
40	5395	6349	11589	12998			
41	47	450	7094	13582			
42		615	10583	6416			
43	66	1669	8599	12186			
44	943	2208	9369	3522			
45		119	1955	818			
46			64	190			
47			241	480			
48			63	88			
49			461	97			
50		64	2250	953			
51		81	2604	4887			
52		100	2254	6739			
53		143	2675	2379			
54		382	2067	4274			
55		81	2791	1498			
56		186	3772	6331			
57		55	1498	3376			
58		42	1464	3277			
59			445	223			
60			308	560			
61			251	739			
62			508	1635			
63			1119	3585			
64			540	1053			
65			2602	6597			
66			3832	5718			
67		107	2555	1930			
68			708	770			
69			495	1123			
70			577	1202			
71			451	754			
72			163	155			
73			102	97			
74			230	802			
75			92	527			
76			90	521			
77			508	5587			
78			329	1696			
79			560	2618			
80			1157	497			
81			516	716			
82			183	333			
83			146	292			
84			99	308			
85			133	277			
86			43	100			
87				59			
88				41			
89			87	646			
90			92	425			
91			379	4205			
92			118	620			
93			220	900			
94		95	6484	5450			
95			520	639			
96			61	118			
97			57	111			
98				66			
99				40			
100							
101				48			
102				151			
103				798			
104				186			
105			48	794			
106			62	264			
107			437	2639			
108			424	761			
109			91	77			
110				42			
111							
112							
113							
114							
115				439			
116				120			
117				243			
118			71	147			
119			148	1247			
120			127	392			
121			106	2828			
122			97	406			
123				48			
124							
125							
126							
127				48			

Number and Relative Peak Intensity (Continued)

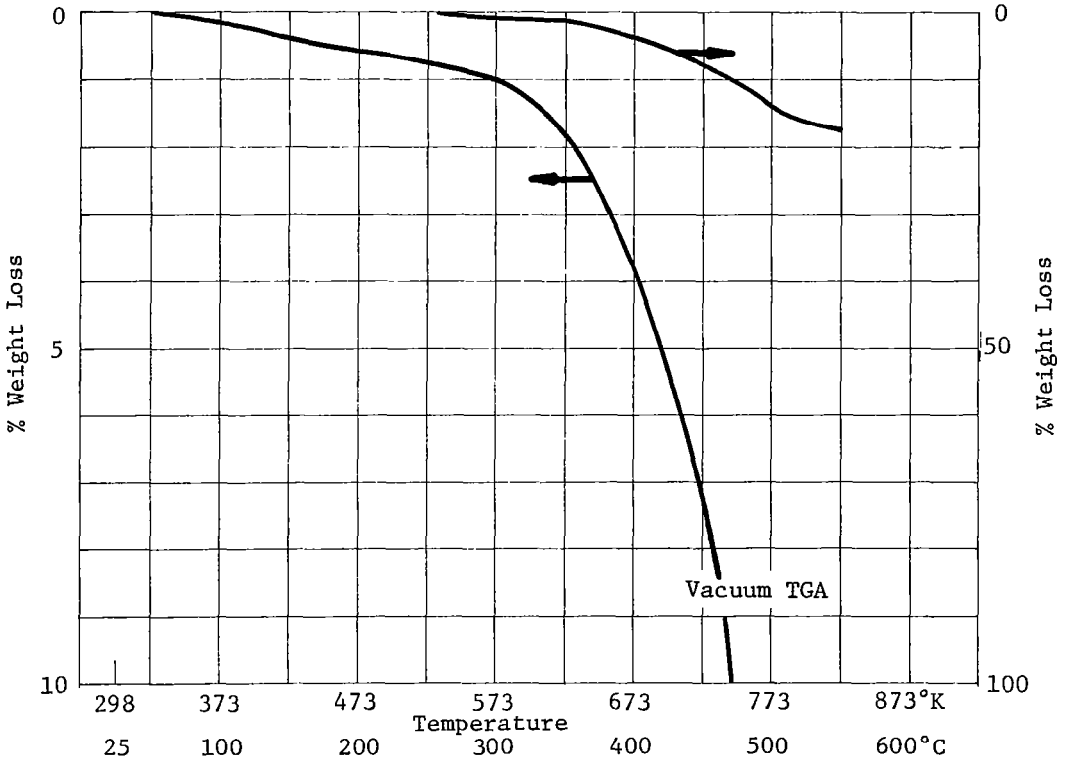
Temperature, ^{o}K (^{o}C) — Ablebond 113-4

m/e	298 (25)	523 (250)	623 (350)	723 (450)			
128				96			
129				66			
130							
131				360			
132				161			
133				447			
134			125	1178			
135				397			
136				556			
137							
138							
139							
140							
141							
142							
143							
144							
145				75			
146				65			
147				65			
148				41			
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159				82			
160							
161				60			
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 548°K (275°C) - 703°K (430°C)

a_o = 4.1% of initial weight

$$k = 1.8 \times 10^{9} \exp\left(\frac{-30,000}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	8.0×10^{10}	
373°K (100°C)	1.5×10^{8}	
423°K (150°C)	1.2×10^{6}	

Number and Relative Peak Intensity

Temperature, °K (°C) — Ablestik 184-1

m/e	298 (25)	573 (300)	673 (400)	773 (500)			
14	26106	25872	28842	33688			
15	957	2770	16245	36377			
16	16780	16089	20283	31022			
17	57832	42927	37736	36027			
18	100000	100000	100000	100000			
19	273	263	310	469			
20	8706	7571	6799	7512			
21							
22							
23							
24		166	543	1060			
25	133	623	1918	3901			
26	718	3000	9118	17952			
27		2396	6355	11464			
28	100000	100000	100000	100000			
29	2944	4019	7985	12375			
30	454	659	929	1521			
31	74823	917	1063	1512			
32	125	72386	70054	69459			
33		170	233	307			
34	435	586	625	872			
35			72	105			
36	265	226	320	394			
37		94	148	282			
38	70	172	287	578			
39				2071			
40	96743	87686	80261	87829			
41	175	853	1150	1934			
42	137	534	910	1445			
43	308	1450	2785	4233			
44	1909	2473	2922	3316			
45	83	1201	5029	9615			
46		105	368	670			
47		220	1192	2260			
48		55	108	355			
49		112	185	276			
50	48	227	168	310			
51		149	270	457			
52		60	143	383			
53		111	169	322			
54		48	41	123			
55		236	420	705			
56		379	414	514			
57		272	602	916			
58		389	587	1076			
59		1321	3578	6849			
60	62	298	739	1230			
61		505	2914	5751			
62			229	429			
63		71	212	396			
64	50	85	93	134			
65	93	54	49	353			
66	62	104	385	846			
67		71	111	2654			
68		45		65			
69		59		137			
70			80	114			
71		75	399	785			
72		52	421	891			
73		1003	6286	14215			
74		165	1243	2608			
75		768	4867	8750			
76	43	69	333	696			
77		71	371	754			
78			75	205			
79			56	122			
80			69				
81		168	1615	3088			
82		119	1014	1813			
83		42	214	349			
84	57	60	160	178			
85		44	325	655			
86		43	187	309			
87		203	1881	3337			
88		128	1194	2191			
89		396	3053	5912			
90		75	398	826			
91		254	521	696			
92		98	189	226			
93							
94				50			
95				64			
96		2556	18270	32401			
97							
98			265				
99				48			
100				49			
101			116	300			
102		41	584	1073			
103		441	3656	6860			
104		57	854	1498			
105		53	1158	1968			
106		161	113	210			
107			55	229			
108							
109							
110				43			
111			63	123			
112				56			
113				42			
114				60			
115		163	1654	3051			
116			221	437			
117		73	914	1636			
118			257	438			
119		353	2873	5248			
120			290	574			
121			278	556			
122				40			
123				386			
124				109			
125			107	60			
126							
127							

Number and Relative Peak Intensity (Continued)

Temperature, °K (°C) — Ablestik 184-1

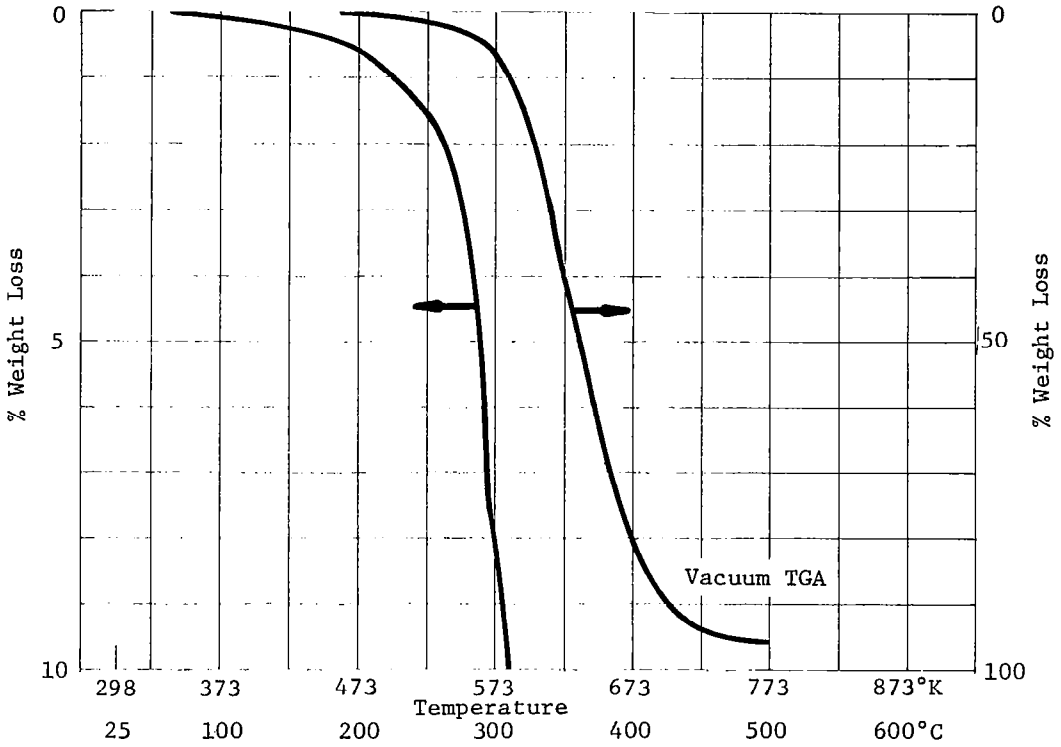
m/e	298 (25)	573 (300)	673 (400)	773 (500)			
128							
129	175	193	183	290			
130				48			
131	93	127	338	618			
132	143	203	465				
133		857	6618	11368			
134		129	986	1620			
135		42	575	1012			
136			62	103			
137							
138							
139							
140							
141							
142							
143							
144							
145			84	133			
146			89	115			
147		125	1284	2853			
148			187	429			
149			341	651			
150				79			
151							
152							
153							
154							
155							
156							
157							
158							
159				75			
160				40			
161			373	689			
162			63	166			
163		53	817	1247			
164			73	167			
165			237	428			
166				69			
167							
168							
169							
170							
171							
172							
173							
174							
175							
176			257	242			
177		86	957	1617			
178			91	257			
179			92	244			
180							
181							
182							
183							
184							
185							
186							
187							
188							
189				63			
190							
191							
192		149	1295	2228			
193			171	353			
194		41	155	832			
195				75			
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207		1162	8358	12652			
208		141	1567	2509			
209		77	843	1301			
210			87	127			
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Bacon Coil Impregnant
No. 6

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 23 pbw Activator
Cure: 4 hrs. at 369°K (96°C), 6 hrs. at 408°K (135°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 498°K (225°C) - 773°K (500°C)

a_o = 93.7% of initial weight

$$k = 9.26 \times 10^{8} \exp\left(\frac{-27,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	4.1×10^{9}	
373°K (100°C)	1.2×10^{7}	
423°K (150°C)	1.5×10^{5}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Bacon Coil Impregnant No. 6

m/e	298 (25)	473 (200)	573 (300)	673 (400)	773 (500)		
14	2343	2381	4265	5851	3588		
15	885	1231	11135	11329	5048		
16	5245	5121	15298	9758	8789		
17	19295	17079	33225	22828	16931		
18	63765	55487	86843	72102	53030		
19	225	222	357	561	241		
20	562	513	961	750	664		
21			40				
22			47	55			
23							
24	51	66	1208	818	236		
25	108	198	3769	2942	805		
26	525	836	17356	13011	3889		
27	676	1096	42211	15104	4734		
28	27185	26490	46783	48744	34246		
29	558	792	19572	14033	3112		
30	529	648	4922	4504	1520		
31	148	216	1889	4449	965		
32	6269	6091	6063	6392	5969		
33			81		57		
34	49	48	60	67	46		
35			86				
36	63	68	552	628	159		
37	41	61	2368	3862	573		
38	74	114	5419	7011	1023		
39	187	593	57021	23778	3833		
40	3979	4005	23627	12858	5499		
41	228	666	47672	7741	2311		
42	145	339	11789	6595	1734		
43	217	562	14042	17520	2521		
44	1038	1194	5199	7471	2345		
45	88	145	1252	2485	716		
46		41	178	466	162		
47			146	1229	104		
48			351	270	64		
49		46	1458	1421	233		
50	77	224	8116	6319	1129		
51	77	197	14925	7641	1438		
52	45	131	8099	2962	627		
53	44	185	30890	5121	937		
54		66	3716	1402	350		
55	87	282	11943	5640	937		
56	62	131	1644	1800	549		
57	63	148	1469	3310	770		
58		205	2033	2671	861		
59		100	907	675	138		
60		43		942	201		
61			557	1532	194		
62			1585	2556	360		
63		70	4920	5229	798		
64	92		1678	1867	321		
65		183	11945	11163	1247		
66	88	143	5214	12276	1137		
67	75	259	45038	2192	448		
68	56	243	64311	1362	323		
69	42	111	7920	716	233		
70		71	1079	1574	589		
71		44	486	437	182		
72			202	424	133		
73			328	553	104		
74			1243	1676	256		
75			998	976	171		
76			1101	746	167		
77	59	244	36290	6865	1340		
78	58	108	8916	2169	540		
79		230	47163	3828	826		
80		80	14618	1379	277		
81		90	11537	927	287		
82		62	2430	475	186		
83	52	76	645	283	127		
84	179	165	719	550	311		
85			290	305	107		
86	64	66	348	399	123		
87			328	264	79		
88			113	93			
89			1221	1178	253		
90				1117	180		
91	52	292	27940	5230	1254		
92	47	128	16383	988	321		
93		352	67309	1574	308		
94		115	17454	16847	1318		
95		86	5492	1656	244		
96			709	403	105		
97			236	211	53		
98			156	158	60		
99			63	164	49		
100			43	80			
101			88	168	55		
102			412	309	101		
103			1586	1184	244		
104			725	327	88		
105		81	6723	920	452		
106			1931	327	191		
107		67	10536	4744	977		
108		58	4664	2500	470		
109			566	335	80		
110			131	162	65		
111			69	75	43		
112			59	96			
113			42	49			
114			40	78			
115			933	559	166		
116			227	155	67		
117			755	321	108		
118			222	305	82		
119		81	2643	2221	342		
120			586	649	132		
121		103	15425	3583	568		
122			1861	948	195		
123			223	122	41		
124			41	60			
125				45			
126							
127			51	67			

Number and Relative Peak Intensity (Continued)

Bacon Coil Impregnant No. 6

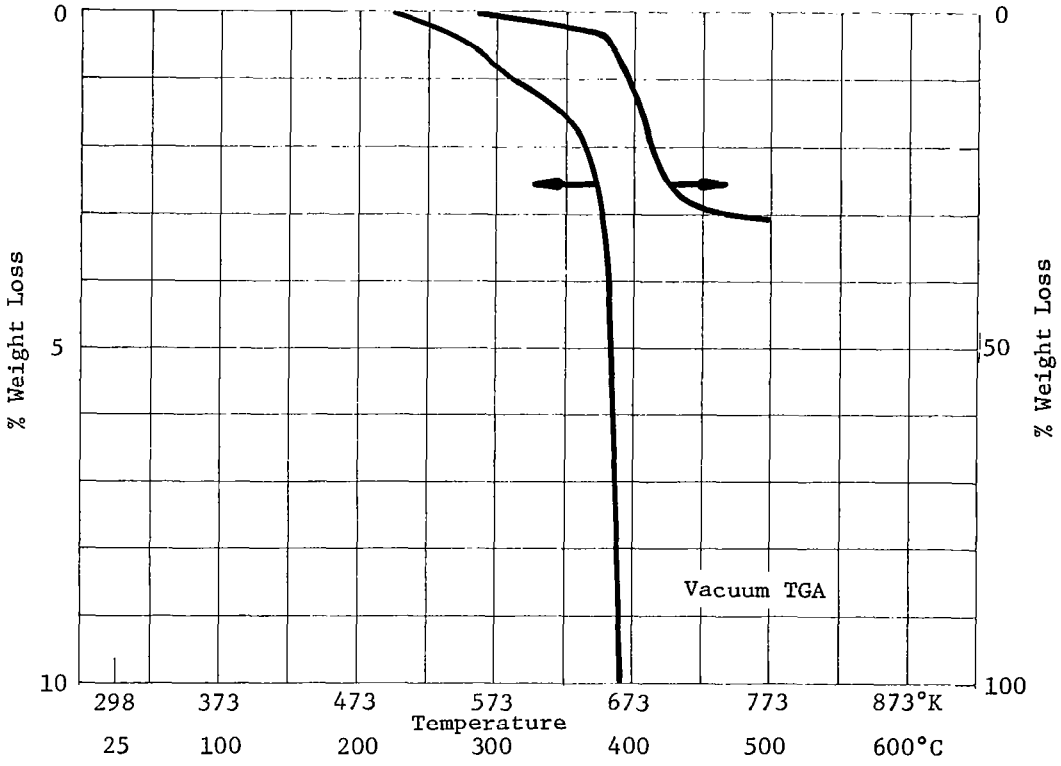
m/e	Temperature, °K (°C)						
	298 (25)	473 (200)	573 (300)	673 (400)	773 (500)		
128			98	132	46		
129	167	155	394	243	201		
130			86	83	44		
131	134	109	314	456	221		
132	155	140	379	319	189		
133			128	519	98		
134	67	55	448	1557	206		
135			227	413	85		
136	46	70	8482	670	124		
137			912	93			
138			99	47			
139							
140							
141							
142							
143							
144				41			
145			43	103	80		
146			41	68			
147			44	79			
148				73			
149				50			
150				62			
151							
152							
153							
154							
155							
156							
157							
158							
159				54			
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

C-93 Epoxy/Glass
Silver/Copper

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $523^{o}K$ ($250^{o}C$) - $723^{o}K$ ($450^{o}C$)

a_o = 30.1% of initial weight

$$k = 4.34 \times 10^{10} \exp\left(\frac{-35,900}{1.98\ T^{o}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	3.2×10^{13}	
$373^{o}K$ ($100^{o}C$)	1.7×10^{10}	
$423^{o}K$ ($150^{o}C$)	5.5×10^{7}	

Number and Relative Peak Intensity

C-93 Epoxy/Glass/Silver/Copper

m/e	Temperature, °K (°C) 298 (25)	573 (300)	673 (400)	773 (500)			
14	2151	2118	523	2757			
15	766	1305	991	3471			
16	4819	4402	1042	7359			
17	18121	14150	3013	13362			
18	60134	45265	10265	41559			
19	981	1312	90	946			
20	544	551	51	629			
21							
22							
23	52	49					
24		51	53	178			
25	86	240	321	605			
26	586	1278	1637	2954			
27	777	1662	1631	3073			
28	25127	25123	5066	28791			
29	536	1429	1531	1617			
30	425	684	251	802			
31	495	600	353	732			
32	5822	5174	614	5995			
33				364			
34		41		873			
35							
36		56		137			
37		86	531	473			
38		160	1013	933			
39	152	489	3215	2851			
40	3221	3392	1555	4301			
41	138	318	587	1026			
42	102	352	352	546			
43	167	618	889	812			
44	882	1394	680	1109			
45	212	277	123	403			
46	64	93		153			
47			144	119			
48		66	203	1641			
49		96	156	215			
50		253	874	1211			
51		169	999	1383			
52		118	329	587			
53		71	492	526			
54		40	72	183			
55		119	662	448			
56		165	105	109			
57		85	47	103			
58		83	43	86			
59				40			
60				73			
61			169	159			
62			351	348			
63		56	720	793			
64	46	360	518	2455			
65		140	1778	1400			
66	61	288	2160	1573			
67		59	168	191			
68		63		72			
69							
70							
71							
72		40					
73				56			
74			159	214			
75			67	135			
76			53	171			
77		51	872	1232			
78	43	72	219	654			
79		65	269	434			
80				112			
81				47			
82							
83							
84	114	119		149			
85							
86				56			
87							
88							
89			70	156			
90				161			
91			557	1081			
92			87	403			
93		42	474	945			
94		180	2729	1206			
95			137	71			
96							
97							
98							
99							
100							
101							
102				55			
103			122	161			
104				96			
105			45	286			
106			68	245			
107			537	866			
108			99	365			
109							
110							
111							
112							
113							
114							
115				98			
116							
117				125			
118				51			
119			215	193			
120				87			
121			618	272			
122			66	97			
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

C-93 Epoxy/Glass/ Silver/Copper

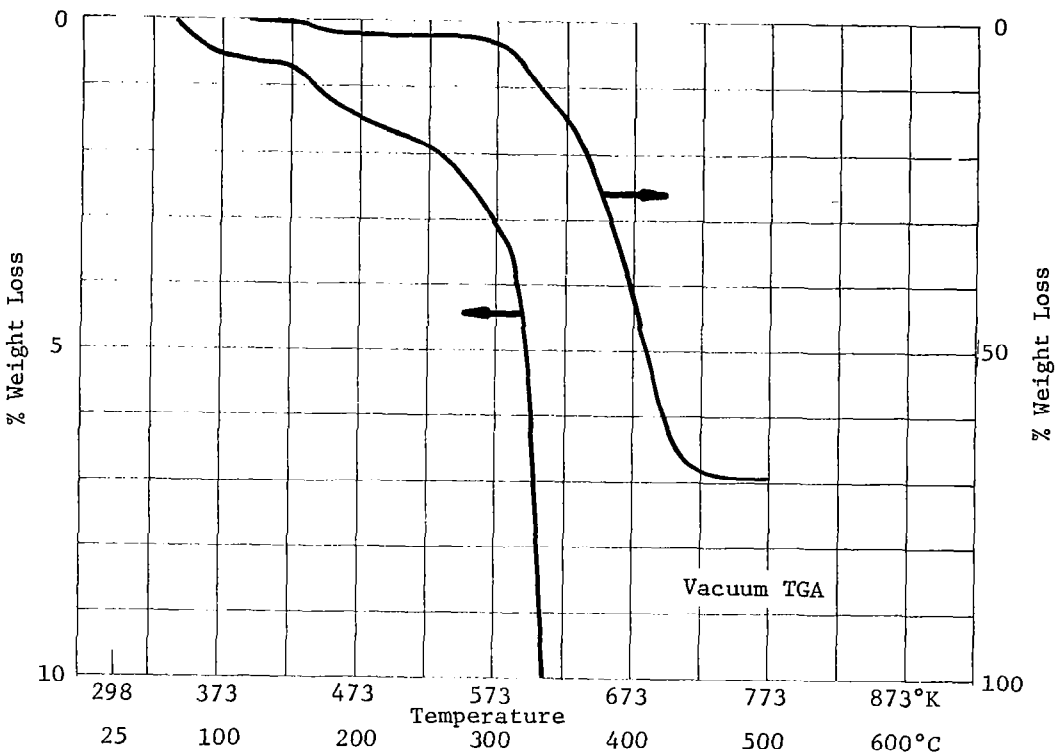
m/e	Temperature, ^{o}K (^{o}C)						
	298 (25)	573 (300)	673 (400)	773 (500)			
128							
129	111	111		181			
130				57			
131	73	82		170			
132	110	106		158			
133							
134		40	144	122			
135							
136			61	60			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Cat-L-Ink 50-700
Black

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 6 pbw Catalyst
Cure: 1 hr. at 366°K (93°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 773°K (500°C)

a_o = 68.1% of initial weight

$$k = 3.2 \times 10^9 \exp\left(\frac{-30,300}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.8×10^{10}	
373°K (100°C)	6.8×10^{9}	
423°K (150°C)	8.3×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Cat-L-Ink 50-700 Black

m/e	298 (25)	373 (100)	573 (300)	673 (400)	773 (500)		
14	276	254	277	773	259		
15			129	1446	251		
16	788	739	957	1334	750		
17	5992	5035	4885	4903	3472		
18	22665	19139	17092	17976	13223		
19							
20							
21							
22							
23							
24							
25				386			
26		67	516	2381	267		
27		109					
28	5229	5093	5483	9644	5283		
29	47	110	275	2616	203		
30		43	151	451			
31			44				
32	1334	1274	1009	1080	883		
33							
34							
35							
36							
37							
38							
39			192	4338	227		
40	72	74	201	1800	80		
41			180	961	47		
42			191				
43		54		2305	116		
44	222	230	435	1619	217		
45				146			
46							
47				230			
48							
49							
50				990			
51				1037			
52							
53				528			
54				73			
55				1120			
56							
57			48	512			
58				222			
59							
60							
61				149			
62							
63				785			
64					42		
65					49		
66				3256	42		
67			62	169			
68				41			
69							
70				64			
71							
72							
73							
74				114			
75							
76							
77				700			
78				168			
79				248			
80							
81							
82							
83							
84							
85							
86							
87							
88							
89				45			
90							
91				554			
92							
93				48			
94			78	5305	78		
95				201			
96							
97							
98							
99							
100							
101							
102							
103				80			
104							
105							
106							
107				580			
108				141			
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119				211			
120				45			
121				687			
122				41			
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

Cat-L-Ink 50-700
Black

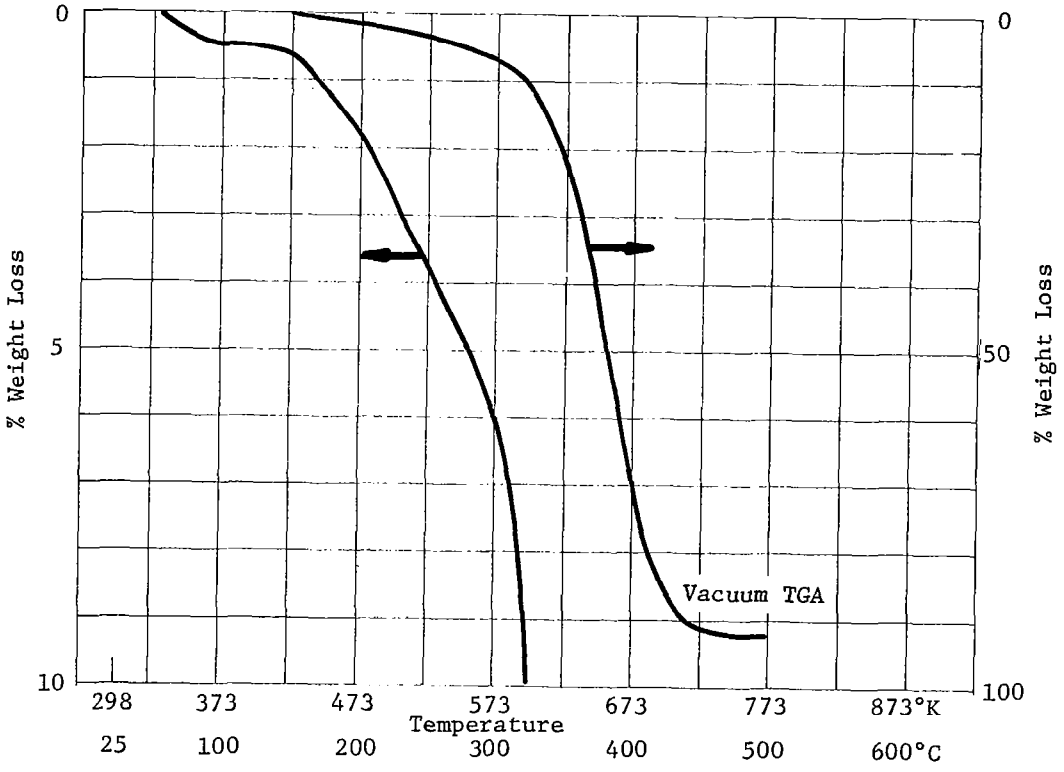
m/e	Temperature, °K (°C)						
	298 (25)	373 (100)	573 (300)	673 (400)	773 (500)		
128							
129							
130							
131							
132				54			
133							
134				173			
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155				378			
156							
157							
158				103			
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Cat-A-Lac (Black)
463-3-8

Chemical Characterization Summary

Mix Ratio: 2 pbv Resin to 1 pbv Accelerator
Cure: 24 hrs. at 393°K (120°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 723°K (450°C)

a_o = 89.2% of initial weight

$$k = 1.8 \times 10^{14} \exp\left(\frac{-43,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	7.7×10^{14}	
373°K (100°C)	8.9×10^{10}	
423°K (150°C)	8.8×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Cat-A-Lac (Black)
463-3-8

m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)		
14	1972	2313	2206	4691	2512		
15	47	1239	867	9637	1494		
16	1763	2498	3714	7339	2666		
17	5747	6544	7532	17449	5533		
18	20738	21377	20196	58584	19231		
19							
20							
21							
22							
23							
24				355			
25		135	106				
26	127	1840	1616	11817	2082		
27							
28	31876	34306	32219	52366	31980		
29	114	2381	1840	10055	1703		
30		70	88	7384	326		
31							
32	7314	7367		6721	6477		
33							
34							
35							
36				94			
37					246		
38			59				
39		2160	1391	11183	3373		
40	494			6398	1621		
41		3547	2635		977		
42				12944			
43		9570	3229		1580		
44	308	845	3014	12742	1018		
45		81	54	2172	55		
46				48			
47				331			
48							
49					40		
50		129	69	2686			
51		210	84	2876	1032		
52		40					
53		48	59	2289	401		
54					68		
55					403		
56			1048	4079	58		
57		2165	842	2732	56		
58		2139	173		68		
59				501			
60				147			
61				235	51		
62							
63				1342	521		
64							
65		59	44		1514		
66				5513	1541		
67				1920	58		
68				618			
69		40	44	225			
70				546			
71				479			
72				277			
73				73			
74				207	45		
75				48			
76				91			
77		68	40	1054	1004		
78				456	144		
79				823	269		
80				1273			
81				395			
82				196			
83				76			
84				104			
85		534	84	41			
86							
87							
88							
89				66			
90				43	44		
91		1183	85	909	813		
92		65		135	51		
93				133			
94			140	10692	2172		
95				911	48		
96				41			
97				43			
98							
99							
100		220					
101							
102							
103					70		
104					87		
105				67			
106		222	53	117			
107			46	916	797		
108				924	138		
109				84			
110							
111							
112							
113							
114							
115							
116							
117							
118				44			
119				550	254		
120				55			
121				354			
122				135	663		
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

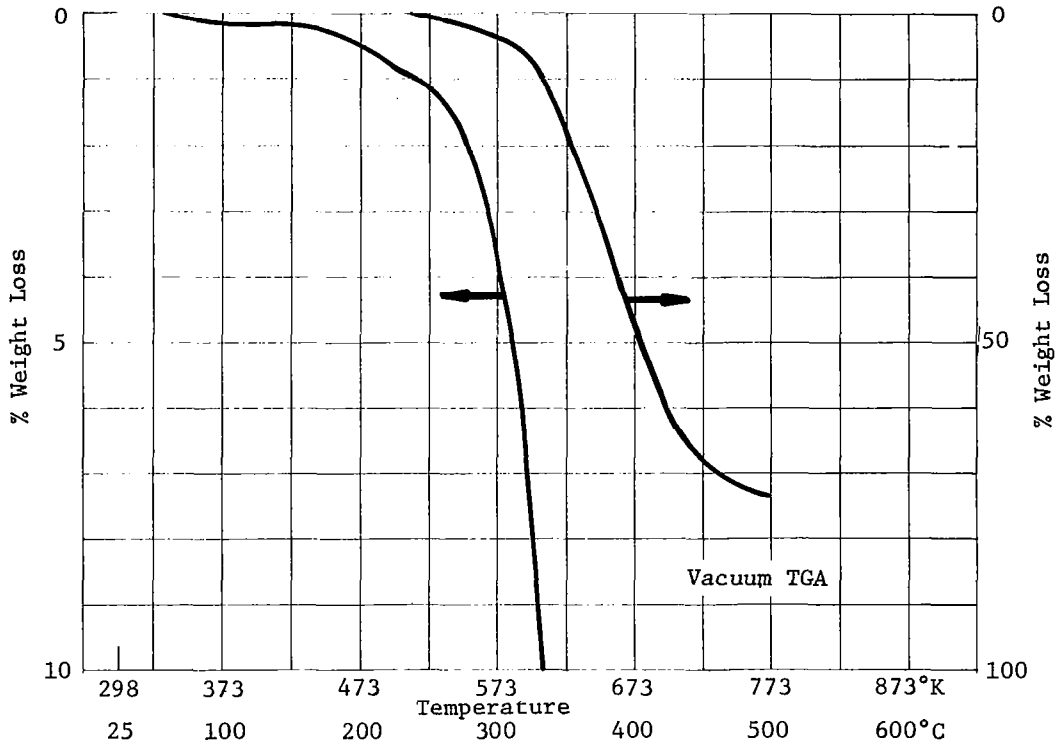
Cat-A-Lac (Black)
463-3-8

m/e	Temperature, °K (°C)						
	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)		
128							
129							
130							
131				40	91		
132					46		
133							
134				65	145		
135				611			
136					43		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 1 pbw Resin to 1 pbw Activator
Cure: 30 min. at 380°K (107°C), 1 hr. at 422°K (149°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 473°K (200°C) - 773°K (500°C)

a_o = 18.2% of initial weight

$$k = 2.49 \times 10^6 \exp\left(\frac{-20,800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	3.2×10^7	
373°K (100°C)	4.1×10^5	
423°K (150°C)	1.5×10^4	

Number and Relative Peak Intensity

Temperature, °K (°C)

Eccobond 57C

m/e.	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
14	1488	1527	1668	2378	1649		
15	176	169	414	2819	967		
16	2044	2051	2381	4689	2563		
17	7259						
18	26723	25486	29737	37080	20323		
19	126	135	137	163	71		
20	249	246	379	587	339		
21							
22							
23				75			
24							
25					73		
26	53	79	420	5142	1037		
27							
28	23924	23569	24424	32022	23312		
29	81	112	340	2562	696		
30			138	2798	158		
31							
32	5701	5410	5341	5013	4613		
33							
34							
35							
36							
37					57		
38			55		71		
39			54	5250			
40	1935	1907	2054	4517	2113		
41			58		898		
42			60	3158	461		
43							
44	187	449	783	2808	276		
45				383			
46				43			
47				89			
48							
49							
50				1325	52		
51				1224	71		
52				1026			
53				960			
54				657			
55				927	138		
56				741	98		
57				347			
58				253			
59				63			
60				56			
61				160			
62							
63				539			
64					50		
65					58		
66				2402	50		
67				914	55		
68				94			
69				57			
70				54			
71							
72							
73				59			
74				69			
75				52			
76							
77				431	46		
78				185			
79				263	40		
80				388			
81				68			
82							
83				43			
84							
85							
86							
87							
88							
89				50			
90							
91				417	56		
92							
93				43			
94			41	4744			
95				174			
96							
97							
98							
99							
100							
101							
102							
103				42			
104							
105							
106							
107				426			
108				339			
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119				409			
120							
121				250			
122				49			
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

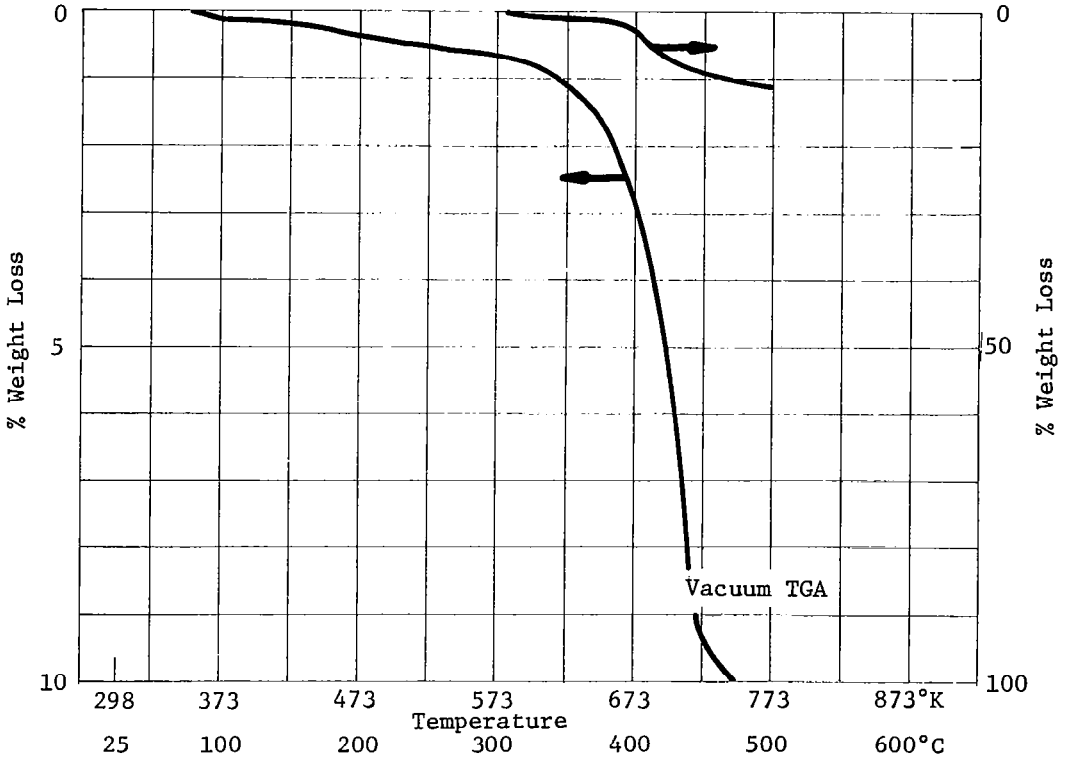
Eccobond 57C

m/e	Temperature, °K (°C) 298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
128							
129			77	87	65		
130							
131				69			
132							
133							
134							
136							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received, Choke Inductor Support
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $523^{o}K$ ($250^{o}C$) - $773^{o}K$ ($500^{o}C$)

a_o = 11.7% of initial weight

$$k = 3.75 \times 10^{9} \exp\left(\frac{-33,100}{1.98\ T^{\circ}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	4.5×10^{12}	
$373^{o}K$ ($100^{o}C$)	4.4×10^{9}	
$423^{o}K$ ($150^{o}C$)	2.2×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C) Epiall 1961

m/e	298 (25)	473 (200)	573 (300)	673 (400)	773 (500)		
14	991	941	942	1610	1012		
15	358	400	440	2680	947		
16	3232	3016	2974	4181	3167		
17	8816	7241	6681	8472	6294		
18	26568	20712	18495	24776	16562		
19	193	190	192	216	143		
20	188	175	172	191	175		
21							
22							
23							
24				104	57		
25			42	359	185		
26	173	175	252	1601	908		
27	379	386	438	1755	1067		
28	8760	8326	8298	13081	9060		
29	155	191	259	1849	562		
30	792	823	793	994	758		
31		58	75	387	86		
32	2521	2340		2163	1953		
33			2288				
34							
35							
36				85	52		
37				360	265		
38			40	510	519		
39			98	1437	1410		
40	1392	1379	1359	1856	1663		
41	44	50	82	655	270		
42	44	46	69	755	167		
43	63	69	120	4292	280		
44	631	637	837	1988	658		
45				153	54		
46				42			
47				68	81		
48							
49				108	120		
50			47	387	565		
51				371	639		
52				195	269		
53				246	364		
54				84	100		
55				261	268		
56				110	52		
57				255	49		
58				843			
59				48			
60				46	42		
61				77	115		
62				125	197		
63				245	378		
64				86	127		
65				488	660		
66				523	700		
67				90	90		
68				58	47		
69				45			
70							
71							
72							
73					41		
74				78	108		
75					60		
76				49	61		
77				269	575		
78				220	291		
79				160	400		
80				67	128		
81				40	43		
82							
83							
84	41			50			
85							
86							
87							
88							
89				47	98		
90				63	144		
91				120	393		
92				55	123		
93				75	68		
94				760	993		
95				69	73		
96							
97							
98							
99							
100							
101							
102							
103					43		
104							
105					75		
106					74		
107				199	601		
108				183	476		
109					45		
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121					62		
122					87		
123							
124							
125							
126							
127							

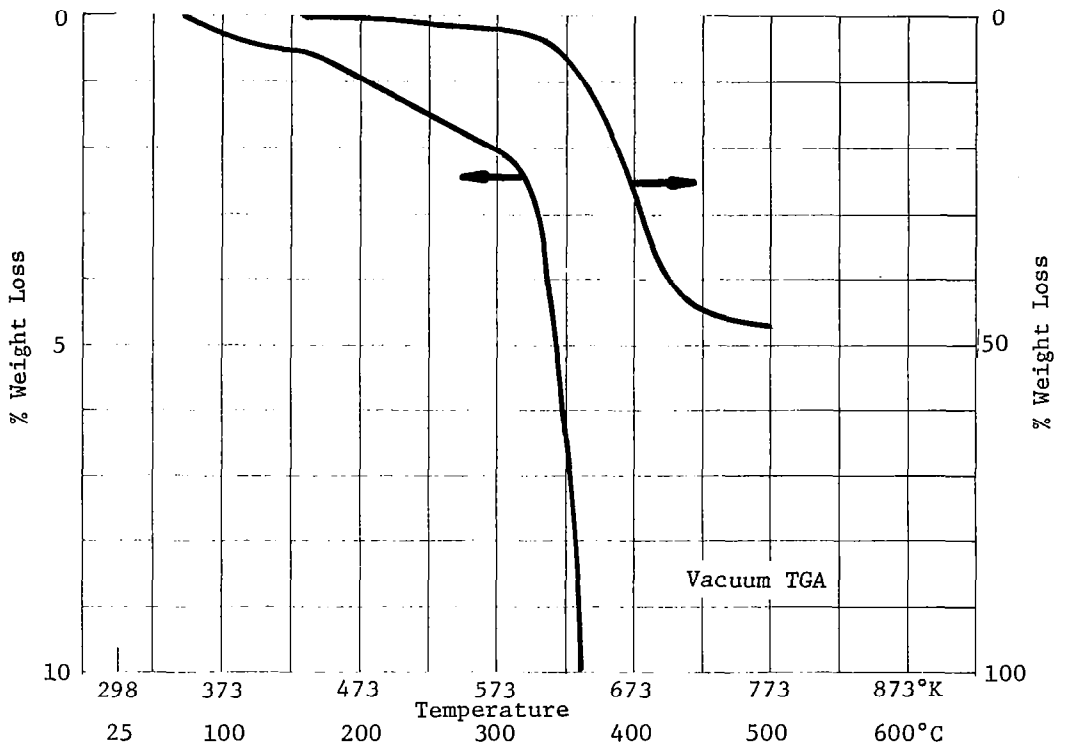
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					Epiall 1961	
	298 (25)	473 (200)	573 (300)	673 (400)	773 (500)		
128							
129	42	40			40		
130							
131				51	48		
132				49	40		
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 823°K (550°C)

a_o = 46.2% of initial weight

$$k = 8.62 \times 10^{14} \exp\left(\frac{-46{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	2.2×10^{16}	
373°K (100°C)	1.3×10^{12}	
423°K (150°C)	7.9×10^{8}	

Number and Relative Peak Intensity

Temperature, °K (°C) — Epoxy DE-8501

m/e	298 (25)	523 (250)	623 (350)	723 (450)	823 (550)		
14	1075	1101	2082	1483	1426		
15	564	637	3629	1906	1774		
16	3709	3595	5729	4043	4320		
17	10531	9193	15134	9125	8377		
18	33004	27467	45784	26298	24243		
19	1102	568	1103	543			
20	619		951	782	802		
21							
22							
23							
24			275	152	66		
25		68	926	531	234		
26	226	369	4652	2558	1105		
27	451	538	4774	3750	1402		
28	12467	12389	20519	16135	13882		
29	223	362	3602	2524	733		
30	575	596	1999	973	703		
31			1035	240	115		
32	2148	2948	2822	2692	2676		
33	2422		43				
34							
35							
36			161	102			
37			823	425	101		
38			1438	821	188		
39			4534	3588	669		
40		2482	4515	3400	2658		
41	51	105	2772	3062	512		
42	52	87	2823	1465	326		
43	68	132	2384	2391	393		
44	708	871	3573	1247	688		
45			510	177	84		
46			69	53			
47			185	76			
48			73				
49			319	165	43		
50			1228	819	186		
51			1174	1055	228		
52			864	457	110		
53			943	777	140		
54			382	345	57		
55			836	1292	160		
56			799	835	108		
57			551	703	58		
58			488	180			
59			160	57			
60			146	99			
61			191	129			
62			332	266	51		
63			641	602	128		
64			338	220	59		
65			1574	1085	187		
66		41	1830	902	167		
67	46		920	486	78		
68			238	223			
69			112	302			
70			130	314			
71			111	215			
72			84	60			
73			93	61			
74			188	160			
75			110	114			
76			103	101			
77			568	1081	215		
78			337	351	86		
79				546	101		
80			478	166			
81			216	201			
82			91	123			
83			66	123			
84	68	74	123	173	81		
85			77	128			
86			49	64			
87							
88							
89			105	152			
90			85	114			
91			443	847	218		
92			142	155	56		
93			265	186			
94			3254	1032	135		
95			467	196			
96			53	54			
97				56			
98				42			
99							
100							
101							
102				46			
103			69	194			
104				52			
105			93	206	53		
106			107	66			
107			676	776	156		
108			383	258	56		
109			92	45			
110							
111							
112							
113							
114							
115			55	121			
116							
117				72			
118			69	43			
119			189	288			
120			83	89			
121			170	585	64		
122			97	121			
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

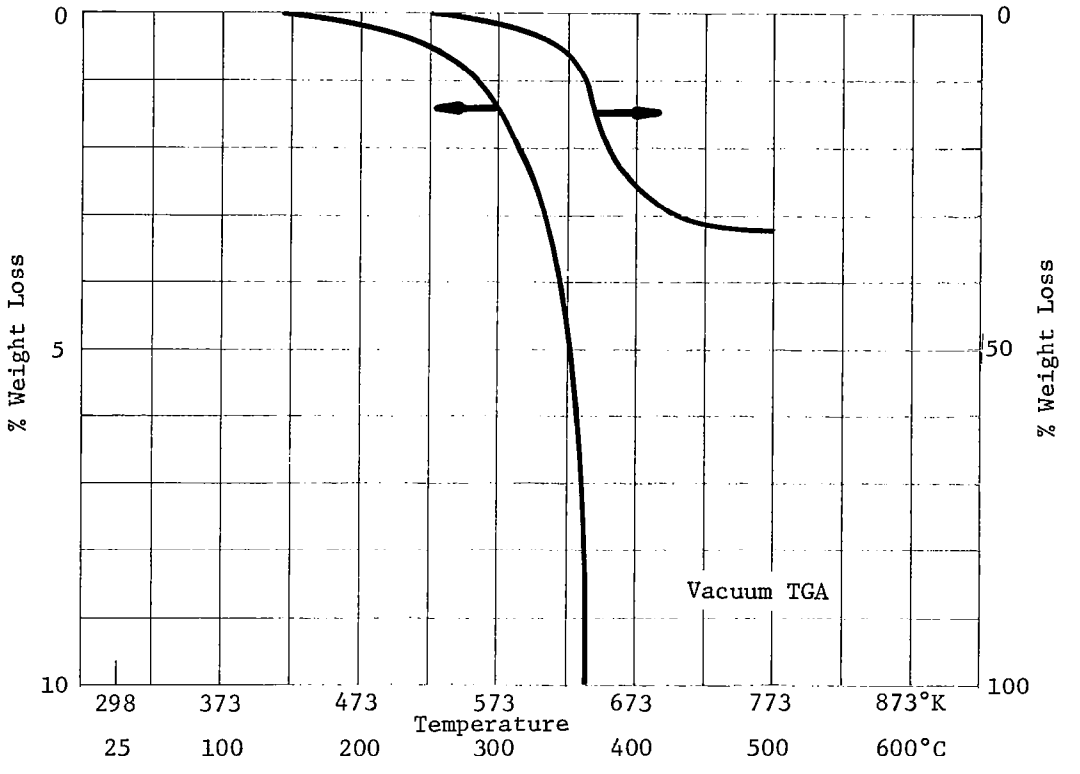
Epoxy DE-8501

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)	823 (550)		
128				40			
129	79	92	99	97	85		
130							
131	59	58	105	124	74		
132	75	73	103	109	81		
133			50	82			
134			147	183			
135			572	169			
136			97	115			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150			66				
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 3 pbw Resin to 1 pbw Accelerator
Cure: 24 hrs. at 403°K (130°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 423°K (150°C) - 773°K (500°C)

a_o = 33.0% of initial weight

$$k = 1.18 \times 10^6 \exp\left(\frac{-21,100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.2×10^8	
373°K (100°C)	1.4×10^6	
423°K (150°C)	4.7×10^4	

Number and Relative Peak Intensity

Epoxy K762

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)			
14	3027	3026	4209	2889			
15	71	346	2715	1503			
16	5448	5230	8543	4584			
17	9646	9411	13714	8069			
18	29977	26752	38981	22447			
19	5188	5631	5257	2309			
20			56	44			
21				132			
22				1916			
23				4763			
24			51	19568			
25			442	132			
26		61	5132	1916			
27	83	344	6904	4763			
28	13913	15019	28644	19568			
29	46	173	5483	3579			
30	628	762	2905	1018			
31			514				
32	2742	2788	3552	2880			
33							
34							
35							
36			55				
37			943	257			
38			2529	654			
39		53	8491	4549			
40	1146	1268	4415	2149			
41		73	3013	3675			
42		69	3447	1445			
43		119	3371	2418			
44	286	885	5317	795			
45			203				
46							
47							
48							
49			117	43			
50			1646	632			
51			1733	970			
52			867	206			
53			963	539			
54			280	135			
55			1071	1138			
56			842	626			
57			799	492			
58			327	56			
59							
60							
61			118				
62			482	96			
63			1500	422			
64			283	51			
65			3312	726			
66			3246	689			
67			775	224			
68			100	57			
69			41	89			
70			54	177			
71				47			
72							
73							
74			120				
75			71				
76			50				
77			699	800			
78			283	201			
79			255	439			
80			606	57			
81			175	93			
82				52			
83							
84							
85							
86							
87							
88							
89			64	44			
90							
91			405	880			
92			116	57			
93			383	140			
94			7481	1137			
95			347	62			
96							
97							
98							
99							
100							
101							
102				41			
103			42	56			
104							
105				99			
106							
107			303	426			
108			175	114			
109							
110							
111							
112							
113							
114							
115				55			
116							
117				47			
118							
119			89	218			
120				67			
121			44	372			
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

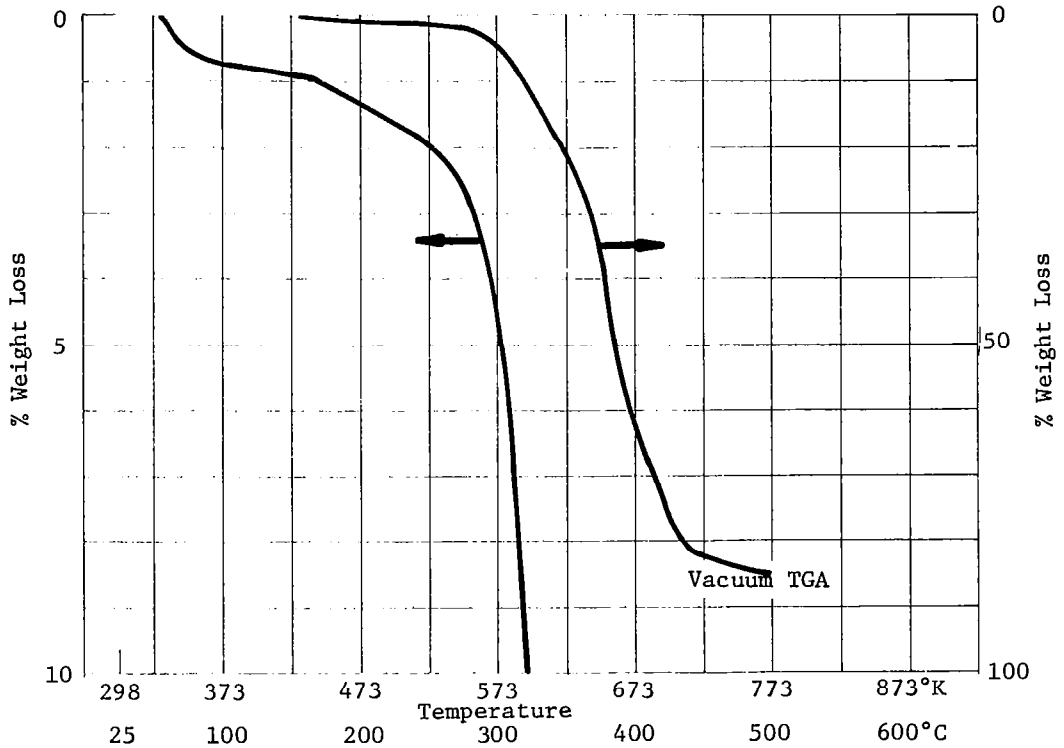
Epoxy K762

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)			
128							
129							
130							
131				57			
132				42			
133				53			
134			95	181			
135			50	58			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: 1 hr. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 473°K (200°C) - 773°K (500°C)

a_o = 87.7% of initial weight

$$k = 9.0 \times 10^4 \exp\left(\frac{-17,800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	8.1×10^6	
373°K (100°C)	1.9×10^5	
423°K (150°C)	1.1×10^4	

Number and Relative Peak Intensity

Temperature, °K (°C)

Hexabond HB 6831

m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
14	821	958	755	3329	1678	1760	
15	59	143	432	8818	3999	4435	
16	1846	2641	6086	30278	6200	7448	
17	12812	13187	15377	38874	12680	9777	
18	49923	48974	38028	74004	40254	34753	
19	811	833	601	825	243	288	
20	219	244	192	396	375	228	
21							
22				365			
23							
24				866	193	59	
25				4284	1508	430	
26	113	201	581	22660	8852	3233	
27	172	555	1136	28489	15099	4731	
28	26579	27797	27087	72500	40899	32807	
29	399	702	1149	14274	7826	2612	
30	207	307	336	12765	2899	1445	
31	122	138	130	6384	981	366	
32	7678	6898	6330	8296	6192	6201	
33				591			
34				865		46	
35							
36				1578	256	68	
37				12985	2182	231	
38			43	26086	4685	611	
39		227	635	83920	19382	3277	
40	516	552	706	34445	6300	1440	
41	70	518	1351	18897	11480	1869	
42	56	109	293	24395	4506	867	
43	159	471	1156	13561	6764	1181	
44	1541	2519	13112	100637	7363	2907	
45	53	81	114	4431	667	200	
46				1649	181		
47				5794	330		
48				716	75		
49				4682	754	64	
50			89	22241	5551	860	
51			54	23581	7681	1190	
52				9737	3235	403	
53			84	15110	4867	558	
54			52	5312	1794	150	
55		346	930	20692	5119	479	
56		104	204	4501	1447	183	
57		126	415	3720	1049	101	
58				2420	73		
59				1605	347		
60			46	2447	295		
61				5474	724	68	
62				10464	1899	182	
63				18594	4634	568	
64				6666	48		
65				49380	8446	1052	
66				60769	7687		
67			78	9238	2775	737	
68		40		103	794	142	
69		194	529	3578		50	
70			225	1427	614		
71		115		1042	130		
72			61		69		
73				1706	218		
74				5119	1028		
75				3074		91	
76				2244	699	44	
77							
78				15364	8688	1142	
79				5387	4074	333	
80				8671		426	
81				4027	1203	57	
82			40	3029	1182	45	
83				568	289		
84		67	180	982	112		
85		45	112	706	88		
86				367	70		
87					48		
88				229	56		
89				108			
90				2942	899	81	
91				1814	698	50	
92				14361	6103	1671	
93				2850	1067	243	
94				6100	1647	82	
95				83332	9177	855	
96				6626	1089		
97				363	88		
98				214	46		
99				164			
100				42			
101							
102				145			
103				468	122		
104				2707	1425	77	
105				456	177	43	
106				2017	1048	206	
107				703	227	65	
108				6597	4794	532	
109				5017	1547	154	
110				685	88		
111				61			
112				53			
113							
114							
115							
116				715	400		
117				161	91		
118				361	329		
119				804	93		
120				6997	1372	72	
121				1159	239		
122				6812	3728	160	
123				1242	560		
124				67			
125							
126							
127							

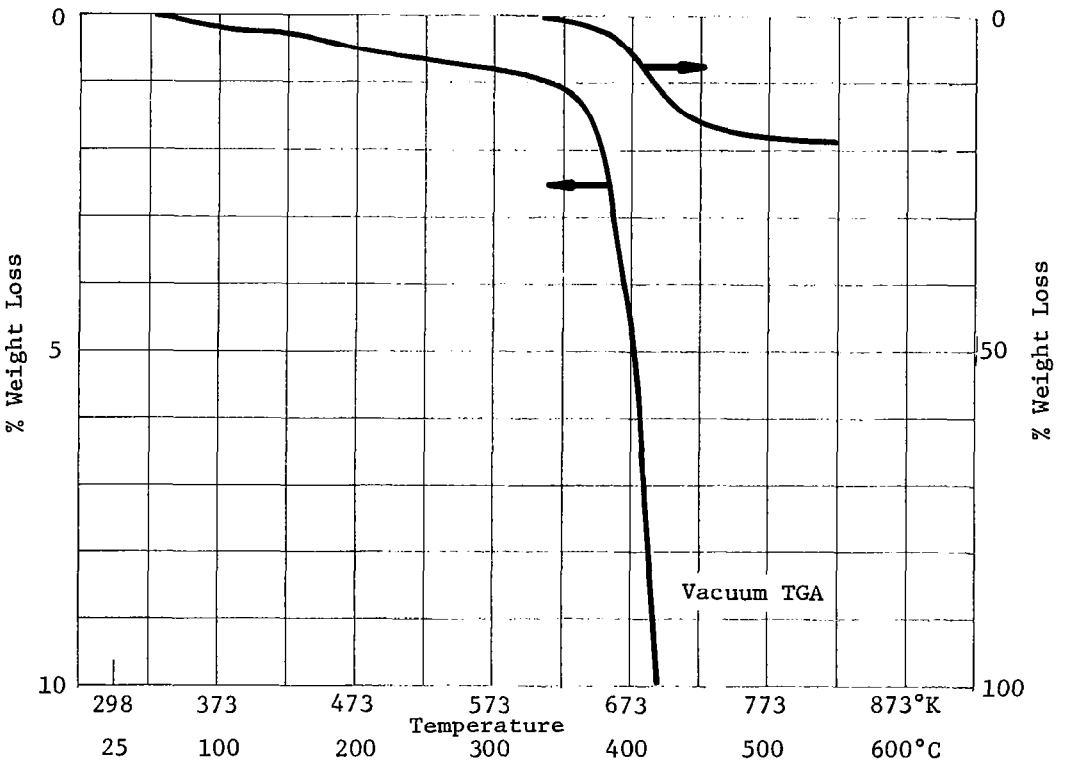
Number and Relative Peak Intensity (Continued)

	Temperature, °K (°C)					Hexabond HB 6831	
m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
128							
129							
130							
131							
132				371	115		
133				159	48		
134				894	100		
135				4370	400		
136				452	175		
137				748	260		
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: Pre-Preg
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 773°K (500°C)

a_o = 17.6% of initial weight

$$k = 1.57 \times 10^{15} \exp\left(\frac{-49,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.6×10^{18}	
373°K (100°C)	4.9×10^{13}	
423°K (150°C)	1.8×10^{10}	

Number and Relative Peak Intensity

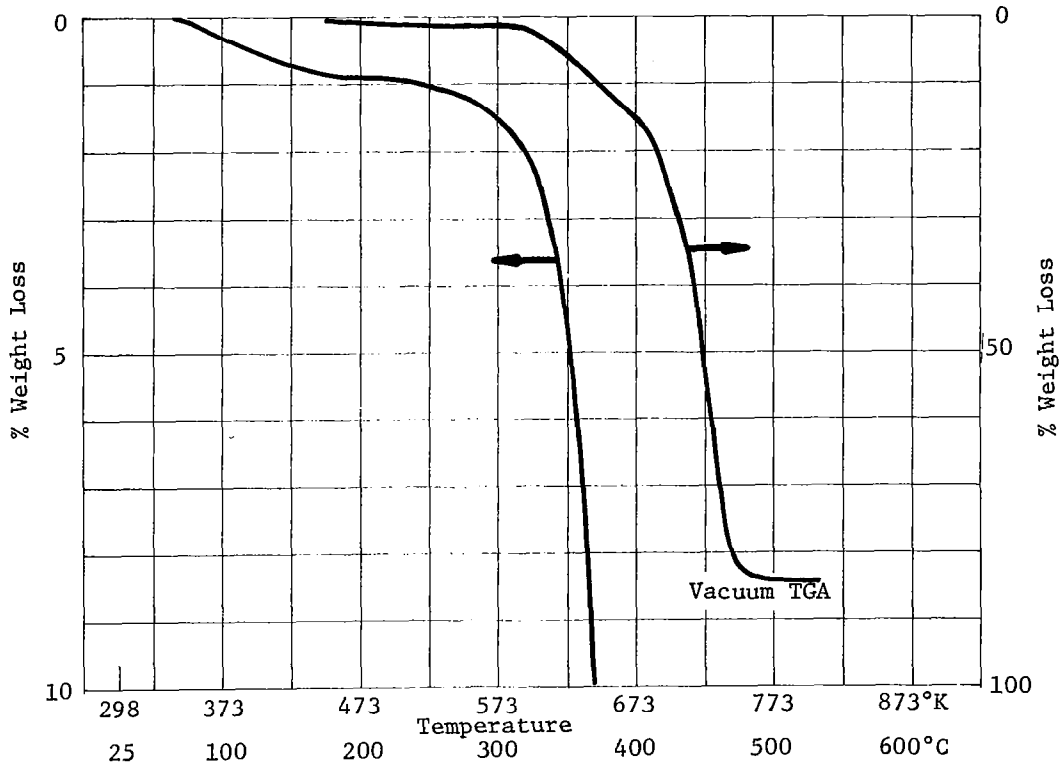
Hexcel F161

m/e	Temperature, °K (°C) 298 (25)	623 (350)	673 (400)	723 (450)	773 (500)		
14	137	180	1066	1076	86		
15		177	2944	218	127		
16	701	572	1449	741	792		
17	5747	4501	6114	4560	4216		
18	22325	17609	23460	17534	16434		
19							
20							
21							
22							
23							
24							
25			298				
26		175	2249	286	86		
27		371	2759	308	111		
28	4825	5862	13611	5884	5079		
29		762	5546	321			
30		57	1004				
31			909				
32	1248	848	990	807	803		
33							
34							
35							
36							
37			182				
38			436				
39		45	2028	375	115		
40			775	65			
41		57	1716				
42		49					
43		457	5894	405			
44	169	464	2239	234	84		
45			159				
46							
47							
48							
49							
50			87				
51			40				
52							
53			48				
54							
55			319				
56			205				
57			204				
58			269				
59							
60							
61							
62							
63							
64							
65			113				
66			198	46			
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94			538	131			
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107			65	66			
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: One Component
Cure: 4 hrs. at 394°K (121°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 773°K (500°C)

a_o = 84.0% of initial weight

$$k = 1.29 \times 10^{8} \exp\left(\frac{-27,900}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.2×10^{10}	
373°K (100°C)	1.2×10^{8}	
423°K (150°C)	1.4×10^{6}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Hysol G7-4247

m/e	298 (25)	423 (150)	573 (300)	673 (400)	823 (550)		
14	831	865	1426	4718	3535		
15	768	894	2403	13426	11578		
16	9629	8448	7843	11240	20812		
17	28947	24728	22509	27081	23719		
18	82418	68943	64220	84105	66882		
19	1939	1851	2018	1810	605		
20	333	280	306	972	642		
21							
22							
23							
24				538	115		
25			368	2873	1156		
26	296	795	3480	15315	7660		
27	608	1357	5992	22213	8710		
28	14915	15891	22550	51029	39214		
29	558	1474	7878	32039	5669		
30	186	292	657	5116	1475		
31	168	591	3868	10922	1301		
32	3267	3055	2949	3690	3706		
33				216			
34							
35				42			
36	256	229	299	1294	683		
37			91	3799	599		
38			391	6803	1603		
39	56	291	2248	23121	6085		
40	3714	3756	4597	14518	7524		
41	198	879	4627	21005	3648		
42	51	260	2437	12450	1635		
43	265	678	4552	29458	4000		
44	1614	1688	3542	13717	13253		
45		50	685	6369	919		
46				358			
47				1287			
48							
49				981	115		
50			185	5379	2085		
51			78	3559	2767		
52				1675	943		
53			90	2650	1389		
54				615	149		
55		130	990	5730	1167		
56		294	3219	5837	777		
57		279	1132	5701	811		
58			1066	5461	416		
59				1902	114		
60				408	41		
61				776	97		
62				1106	366		
63				2421	1251		
64			53	916	189		
65				6985	1670		
66				8846	814		
67				1171	70		
68							
69				627			
70				180			
71				271			
72							
73				710			
74					134		
75				850			
76				112	43		
77					2575		
78				1621			
79				583	850		
80				896	1094		
81				182	72		
82				125			
83							
84							
85				65			
86				63			
87							
88				564			
89							
90				135	156		
91				45	87		
92				1093	3474		
93				203	558		
94				763			
95			53	18659	1370		
96				1269			
97				50			
98							
99							
100							
101							
102							
103							
104				135	207		
105					44		
106				71	1147		
107				53	520		
108				1221	4365		
109				424	2100		
110							
111							
112							
113							
114							
115							
116				41	146		
117							
118					125		
119				48			
120				253	329		
121				47	285		
122				1255	838		
123				71	403		
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

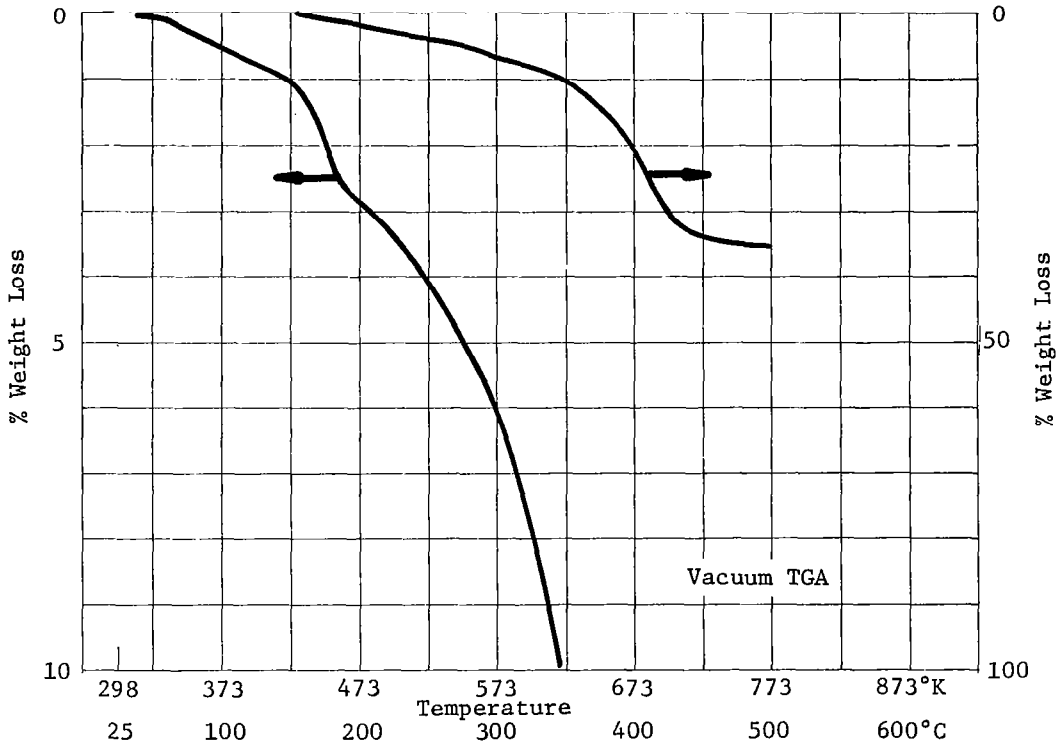
Temperature, °K (°C) — Hysol C7-4247

m/e	298 (25)	423 (150)	573 (300)	673 (400)	823 (550)		
128							
129							
130							
131							
132				209	136		
133				91	42		
134							
135				391	212		
136							
137				177			
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 5 pbw Activator
Cure: 1½ hrs. at 422°K (149°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 723°K (450°C)

a_o = 31.6% of initial weight

$$k = 2.43 \times 10^4 \exp\left(\frac{-16{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.2×10^6	
373°K (100°C)	1.0×10^5	
423°K (150°C)	7.6×10^3	

Number and Relative Peak Intensity

Temperature, °K (°C) — Ink, M-4-N/Cat. A

m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
14	2303	2459	2582	4675	3042	2858	
15	838	1360	1835	9896	2802	3262	
16	4883	4873	5290	7000	5105	6415	
17	18080	15920	16166	18980	13387	12267	
18	60310	51563	51136	62992	42657	38388	
19	1385	1622	1662	1547	884	801	
20	458	397	428	539	457	428	
21							
22							
23	97	97	58				
24				365	96	49	
25	44	94	193	1538	583	323	
26	539	825	1429	7992	2987	1945	
27	836	1138	1861	10334	3166	2269	
28	28303	28666	29486	45202	30588	28807	
29	695	860	1202	6728	2202	1482	
30	436	716	925	5614	851	780	
31	947	1087	1168	2443	1470	1313	
32	6915	6352	6062	5794	5502	5360	
33							
34							
35							
36				158	62		
37				953	536	141	
38			63	1996	1089	328	
39	103	160	322	5261	3924	1343	
40	3113	3262	3452	6662	4481	3703	
41	66	175	360	3916	1249	548	
42	60	592	894	11305	1381	642	
43	130	469	819	6577	1840	855	
44	1131	1918	2408	10829	1555	1099	
45	323	598	889	4143	769	642	
46	73	88	132	265	174	131	
47				176	98		
48							
49				315	157	43	
50		73	153	1553	1072	425	
51			86	1395	1381	543	
52			58	919	447	195	
53				991	717	123	
54				660	107		
55				1740	751	154	
56				2770	221	93	
57				1454	94	60	
58		598	435	7640	375	117	
59		185	80	1879			
60			40	193	53		
61				169	152		
62				301	372	67	
63				645	895	238	
64				275	281	67	
65				1916	1900	448	
66				2540	1930	399	
67				572	205	42	
68				411	59		
69				157			
70				443			
71				491			
72				192			
73				271			
74				133	167	40	
75				55	78		
76				41	78		
77				452	1215	345	
78				323	447	417	
79				366	466	100	
80				452	59		
81				237			
82				222			
83				92			
84	51	69	64	329	74	72	
85				182			
86				55			
87				65			
88							
89					123		
90					79		
91				223	977	709	
92				74	109	184	
93				191	101		
94				4507	2542	418	
95				418	127		
96							
97							
98							
99							
100							
101							
102							
103					170		
104							
105					149	44	
106							
107				359	756	94	
108				362	264		
109							
110							
111							
112							
113							
114							
115					70		
116							
117					44		
118							
119					299		
120					46		
121				77	501		
122				54	91		
123							
124							
125							
126							
127							

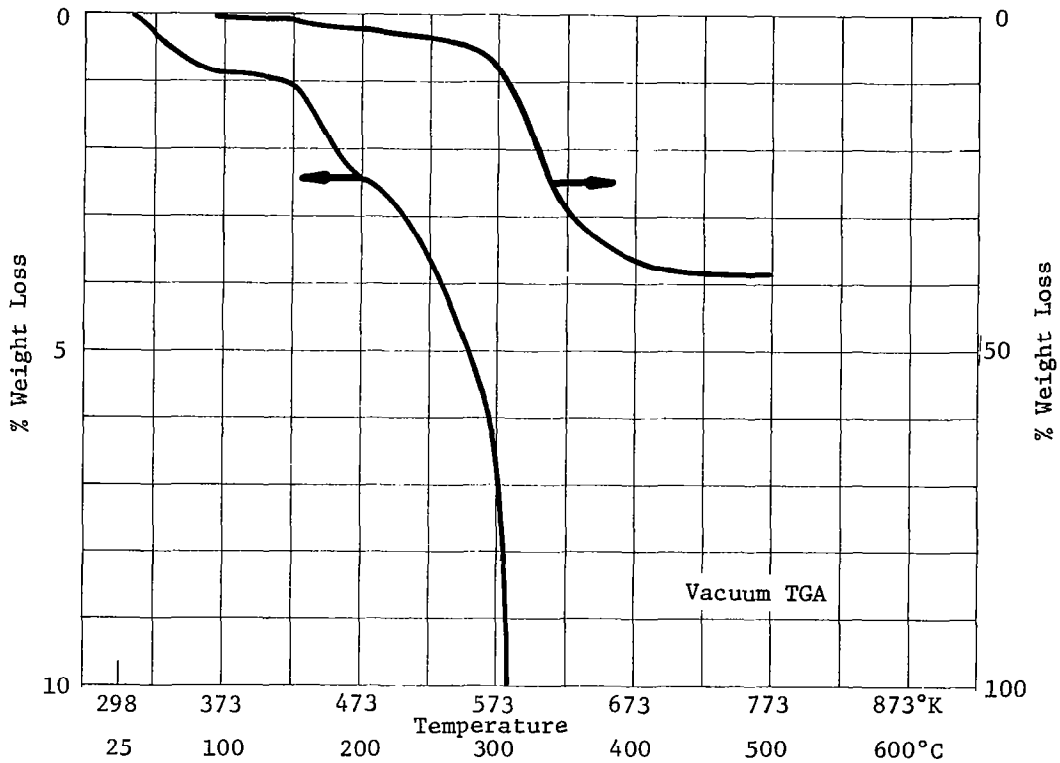
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					Ink, M-4-N/Cat. A	
	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
128							
129	80	89	69	82	70	78	
130							
131			41	85	125	61	
132	68	69	61	111	124	76	
133							
134				50	208		
135							
136					55		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 5 pbw Activator
Cure: 1½ hrs. at 422°K (149°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 723°K (450°C)

a_o = 37.1% of initial weight

$$k = 1.81 \times 10^{15} \exp\left(\frac{-43{,}800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.8×10^{14}	
373°K (100°C)	1.9×10^{10}	
423°K (150°C)	1.7×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C) — Ink, M-O-N/Cat. A

m/e	298 (25)	373 (100)	473 (200)	573 (300)	623 (350)	773 (500)	
14	2007	2088	2276	5105	6324	3088	
15	626	789	1599	11209	13124	4473	
16	4647	4445	4717	7697	8545	8648	
17	19046	16175	15731	23777	24300	14939	
18	64636	53653	52011	78122	80424	47406	
19	725	713	797	854	1060	472	
20	355	375	387	600	675	451	
21							
22							
23							
24				402	1012	92	
25			118	1782	3990	552	
26	364	522	841	8284	17818	3213	
27	473	573	1080	9516	17295	3493	
28	23790	23780	24627	45264	48082	32004	
29	323	432	760	8178	11435	1614	
30	293	348	655	5323	2435	810	
31	201	223	341	3003	3724	475	
32	5833	5467	5473	5247	5872	5157	
33							
34							
35							
36				198	970		
37				1561	7383	373	
38				2996	13761	758	
39		41	151	9034	42119	2673	
40	2967	2983	3206	7658	19761	4390	
41		60	304	5467	8115	1156	
42		98	734	12222	6937	882	
43	51	218	634	14065	23127	923	
44	649	801	1993	12172	6270	3677	
45	54	117	512	5020	2022	296	
46				147	646		
47				363	2832		
48			112	51	361		
49				459	2347	76	
50			235	2064	10838	896	
51				1844	11467	1143	
52			60	946	3443	433	
53				1284	6460	381	
54				570	1130	55	
55				1940	9075	317	
56			49	2109	1228	95	
57				2961	2070	47	
58			571	11229	5111	118	
59			170	837	548		
60				1146	1065		
61				326	2757	70	
62				537	4906	187	
63				1085	9661	584	
64			202	371	3168	138	
65				3392	24026	907	
66				4626	28948	798	
67				644	2824	74	
68				560	1202		
69				184	242		
70				815	159		
71				348	122		
72				377	169		
73				243	881		
74				381	2556	102	
75				89	1488	44	
76				58	1091	64	
77				632	8221	814	
78				335	2543	826	
79				466	3461	313	
80				372	561		
81				187	326		
82				207	115		
83				77	79		
84	48	45	47	905	223	74	
85				942	92		
86				109	184		
87					177		
88							
89					1361	78	
90					737	41	
91				447	7639	1097	
92				83	1086	279	
93				273	1941		
94				7897	42770	1016	
95				577	3042		
96				52	236		
97							
98							
99							
100							
101					110		
102					337		
103					1875	63	
104					239		
105				40	1340	146	
106					188		
107				375	3548	449	
108				316	1190	205	
109					54		
110							
111							
112							
113							
114							
115					938	52	
116					181		
117					292		
118					289		
119				167	4734	68	
120					705		
121				100	6233	93	
122				44	762		
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

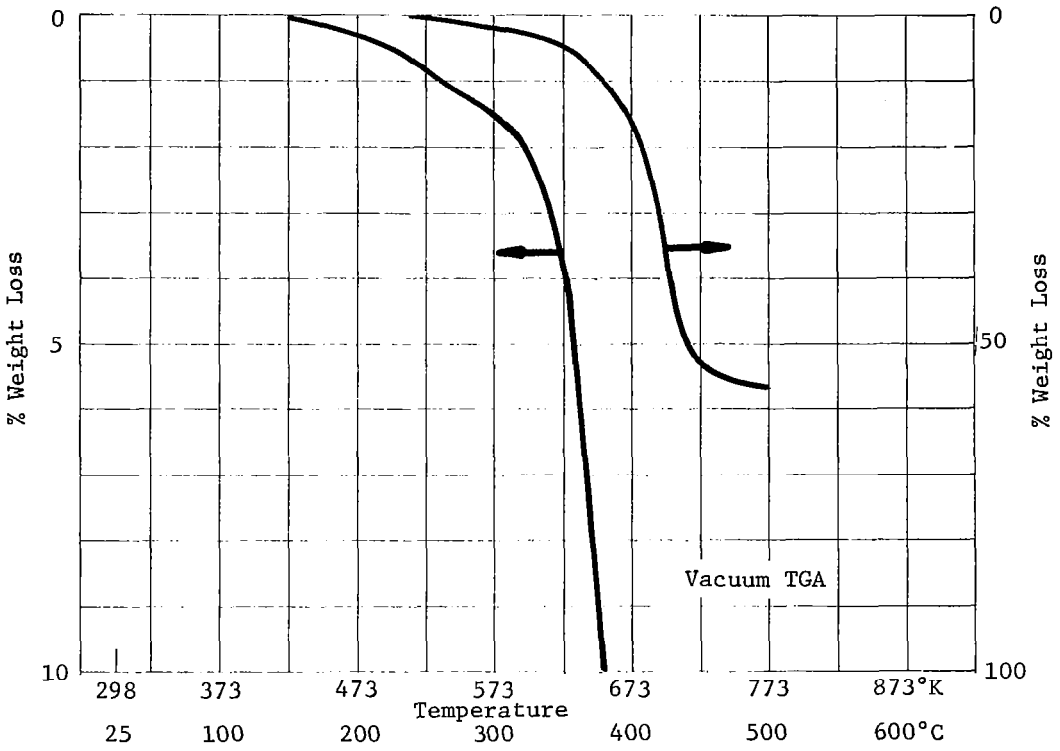
Temperature, °K (°C) — Ink, M-O-N/Cat. A

m/e	298 (25)	373 (100)	473 (200)	573 (300)	623 (350)	773 (500)	
128					141		
129	41		46	86	213	102	
130							
131				78	629	118	
132				80	428	126	
133					1048		
134				211	4282	59	
135					452		
136					1175		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: 1 hr. at 447°K (174°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 448°K (175°C) - 773°K (500°C)

a_o = 55.3% of initial weight

$$k = 2.26 \times 10^{13} \exp\left(\frac{-42,900}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	3.6×10^{15}	
373°K (100°C)	4.4×10^{11}	
423°K (150°C)	4.6×10^{8}	

Number and Relative Peak Intensity

Temperature, °K (°C)

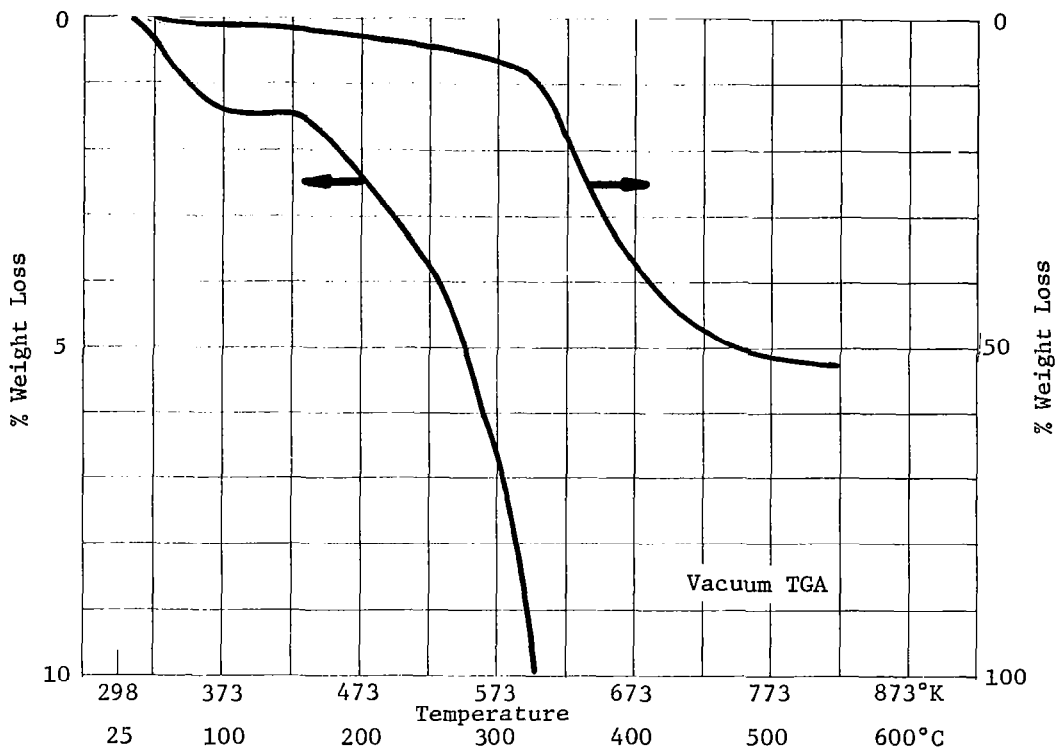
Mica B-Stage 102-18

m/e	298 (25)	473 (200)	573 (300)	823 (550)			
14	1485	1570	3148	1907			
15	211	356	4441	1649			
16	3244	3446	5110	4114			
17	14167	13395	14363	11196			
18	47164	43505	46839	36003			
19	153	152	502	118			
20	140	121	191	143			
21							
22							
23							
24			454	72			
25		102	1853	388			
26	60	724	7741	2307			
27			6501	1687			
28	15544	17032	36218	19028			
29	179	552	8194	1191			
30	333	419	1667	566			
31		70	4232	264			
32	3859	3742	3997	3494			
33			52				
34							
35							
36				77			
37		310	6235	700			
38		371	7287	937			
39		463	3085	2292			
40	756	890	1564	1128			
41		190	1224	586			
42		103	1392	302			
43	56	264	7252	732			
44	488	1538	8867	1175			
45		60	944	122			
46			195				
47							
48			314				
49		127	2927	382			
50		1250	20139	2655			
51		438	2713	2571			
52		377	2833	2218			
53			912	115			
54			83				
55		49	1164	215			
56		40	1293	176			
57		46	524	113			
58			147				
59							
60			375	42			
61			1521	86			
62			444	58			
63		56	506	392			
64			81				
65			105	43			
66			83	40			
67			54				
68							
69			56				
70			62				
71							
72			135				
73		44	1431	212			
74		186	5184	378			
75		78	2819	158			
76		863	19163	455			
77		254	2633	1476			
78		1079	3767	6631			
79			178	371			
80							
81							
82							
83							
84		43	107	64			
85							
86							
87							
88							
89							
90							
91				104			
92							
93							
94							
95							
96				59			
97							
98							
99							
100							
101							
102							
103							
104		356	10248	58			
105			640				
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: 1 pbw Resin to 1 pbw Activator
Cure: 15 min. at 298°K (25°C), 1 hr. at 350°K (77°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 548°K (275°C) - 773°K (500°C)

a_o = 48.1% of initial weight

$$k = 6.11 \times 10^9 \exp\left(\frac{-30,600}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	5.9×10^{10}	
373°K (100°C)	9.6×10^{7}	
423°K (150°C)	7.2×10^{5}	

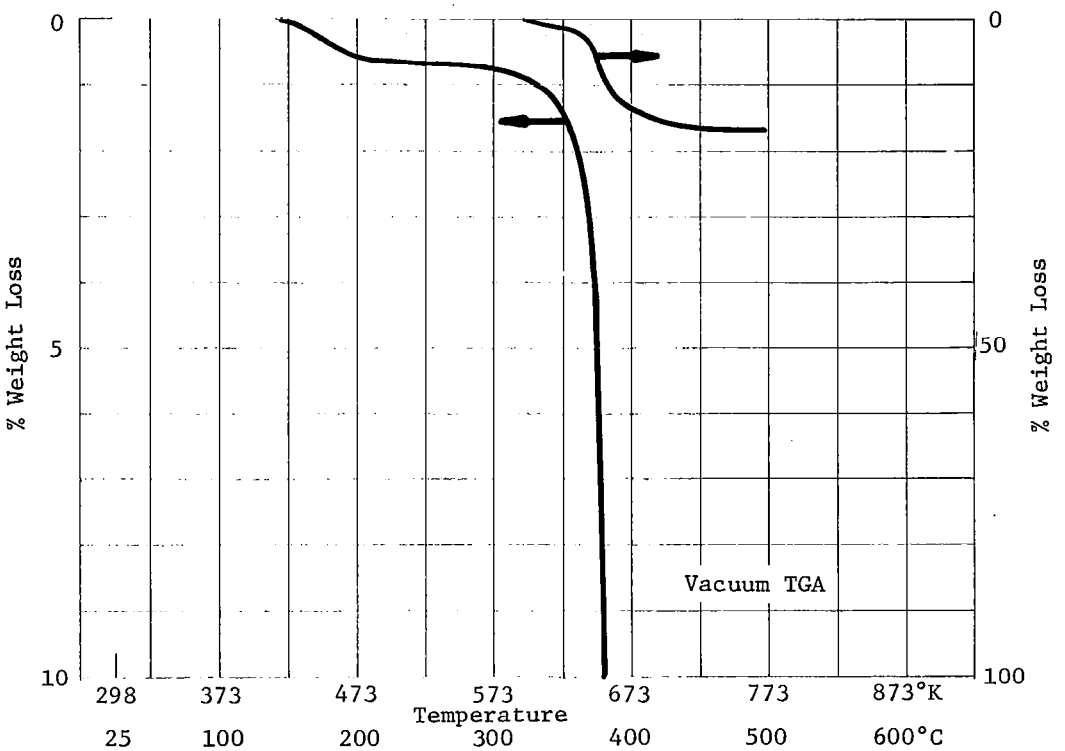
Number and Relative Peak Intensity

	Temperature, °K (°C)					P527 Primer	
m/e	298 (25)	423 (150)	523 (250)	673 (400)	823 (550)		
14	598	679	666	1354	962		
15	124	210	314	1962	1152		
16	1761	1841	21	3581	3519		
17	11010	9808	10168	10202	7300		
18	42751	37295	38704	38728	26379		
19	192	49		69			
20	84	40	67	48	64		
21							
22							
23							
24				138			
25			51	1080	119		
26		413	979	6483	1378		
27	205	544	1522	8820	1726		
28	23548	23288	23091	34593	28418		
29	306	652	1265	6552	1028		
30	87	229	738	1387	333		
31	513	484	641	1339	441		
32	7081	6337	5518	5268	5674		
33							
34							
35							
36				85			
37				1468			
38				3333	96		
39		55	388	13894	976		
40	922	1062	1204	164	1315		
41		123	664	9304	983		
42		56	613	5281	372		
43	91	375	1369	10129	638		
44	385	1390	1764	5926	12824		
45	139		255	602	300		
46	44			119	53		
47				268			
48							
49				497			
50				2923	133		
51				3833	201		
52				1199	45		
53				2532	98		
54			112	846	41		
55			64	5149	267		
56			80	3145	94		
57			108	2914	67		
58			48	655			
59				76			
60				115			
61				436			
62				1033			
63				2476	134		
64				657			
65				5475	184		
66				1197	100		
67			51	411	41		
68				772			
69							
70				1021			
71				693			
72				59			
73				57			
74				372			
75				203			
76				139			
77				3104	175		
78				803			
79					47		
80				1598			
81				267			
82				212			
83							
84				199			
85				278			
86				46			
87							
88							
89							
90				295			
91				167			
92				2423	162		
93				254			
94				345			
95			52	7278	98		
96				442			
97				42			
98							
99							
100							
101							
102							
103							
104				170			
105							
106				173			
107							
108				1105			
109				384			
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120				627			
121							
122				437			
123				57			
124							
135				240			

Chemical Characterization Summary

Mix Ratio: 2 pbw Resin to 3 pbw Activator
Cure: 4 hrs. at 394°K (121°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 773°K (500°C)

a_o = 16.7% of initial weight

$$k = 9.77 \times 10^{16} \exp\left(\frac{-52,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.8×10^{18}	
373°K (100°C)	6.1×10^{13}	
423°K (150°C)	1.3×10^{10}	

Number and Relative Peak Intensity

Temperature, ^{o}K (^{o}C)

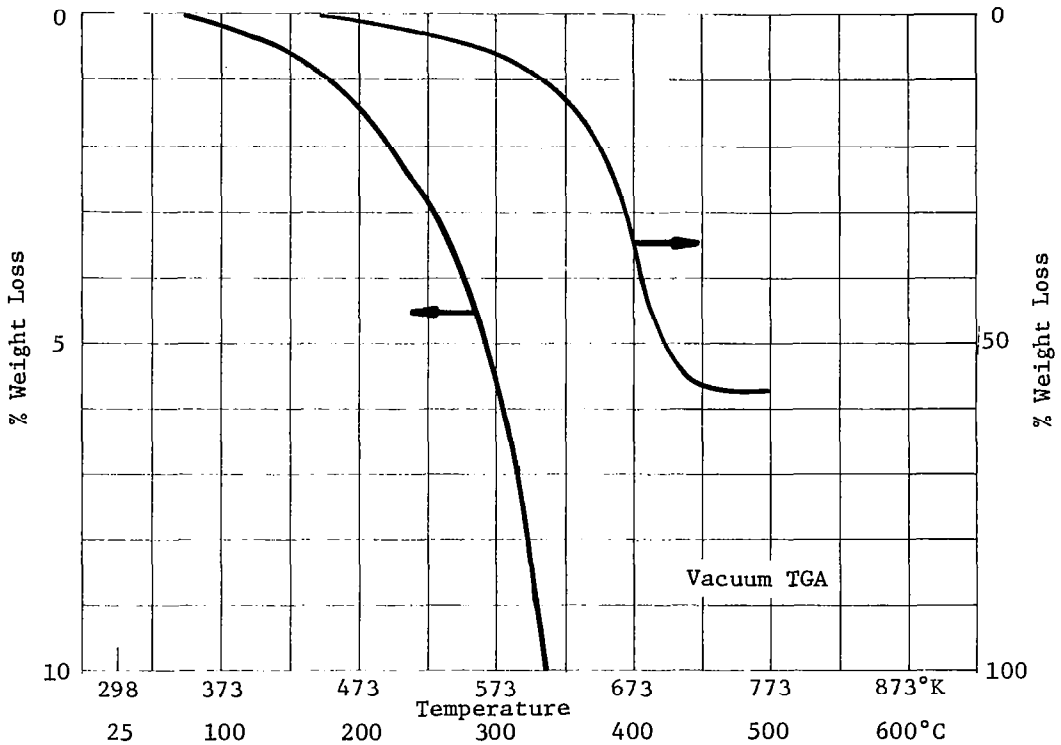
Scotchcast XR5068 Electrical Insulation

m/e	298 (25)	523 (250)	623 (350)	673 (400)	773 (500)		
14	4054	3002	3799	4336	2840		
15	158	305	1490	3430	652		
16	5766	5359	6376	5702	4211		
17	10872	9042	11751	11216	6274		
18	29091	25582	29599	31300	17740		
19	2942	2982	2958	2439	1747		
20	57	57	109	118			
21							
22							
23							
24			61	158			
25			327	1049	63		
26	113	104	2558	5970	917		
27	282	452	3779	6690	1252		
28	22093	19808	30781	32000	16179		
29	151	154	3571	7387	570		
30	878	987	2054	2272	729		
31			509	1716			
32	5125	3987	4469	4258	2749		
33							
34							
35							
36				146			
37			337	2156	122		
38			651	4245	287		
39	40		3025	13211	1058		
40	1790	2254	3419	6398	1827		
41			1168	2309	200		
42		42	1558	2449	140		
43	53	75	2114	8158	238		
44	703	906	8614	3107	568		
45			76	102			
46							
47				283			
48				47			
49				367			
50			311	2495	169		
51			430	2564	253		
52			409	641	80		
53			230	1474	71		
54			162	190			
55			489	2307	128		
56			341	491			
57			949	2409			
58			274	1429			
59							
60				75			
61				576			
62			107	143	78		
63			318	2730	197		
64			83	820			
65			818	6703	441		
66			538	8161	354		
67			121	468			
68			71	147			
69				53			
70							
71							
72							
73				71			
74				465			
75				275			
76				137			
77			92	1317	170		
78			119	561	64		
79			92	534	49		
80			104	100			
81			62	46			
82				114			
83							
84							
85							
86							
87							
88							
89							
90				63			
91				1157	181		
92			55	115	40		
93			182	604			
94			804	12675	780		
95				541			
96							
97							
98							
99							
100							
101							
102							
103				170			
104				46			
105				171			
106							
107				413	91		
108				85	75		
109							
110							
111							
112							
113							
114							
115				55			
116							
117							
118							
119				432	43		
120				54			
121				918	45		
122				44			
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: 2 pbw Resin to 1 pbw Activator
Cure: 3 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 723°K (450°C)

a_o = 62.4% of initial weight

$$k = 3.1 \times 10^6 \exp\left(\frac{-22{,}200}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.3×10^8	
373°K (100°C)	2.2×10^6	
423°K (150°C)	6.2×10^4	

Number and Relative Peak Intensity

Temperature, °K (°C)

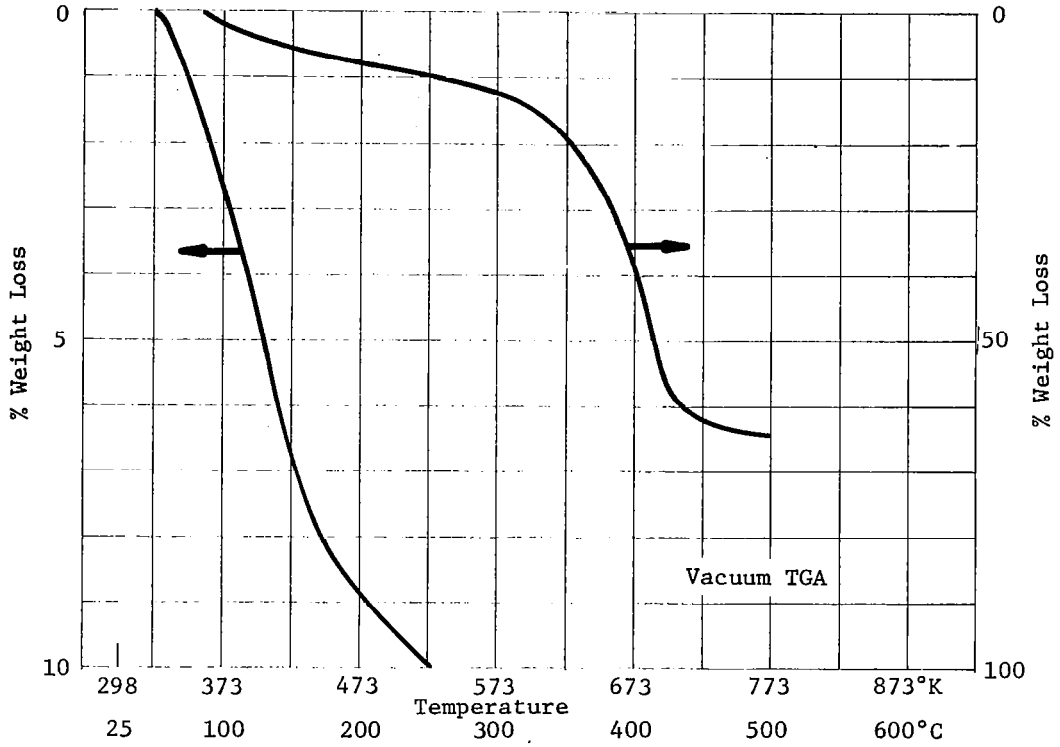
m/e	298 (25)	523 (250)	623 (350)	673 (400)	823 (550)	Scotchcast 243 Encapsulant	
14	1119	1629	2461	3117	1570		
15	325	605	3686	6199	1526		
16	1633	2655	3753	5851	3091		
17	7918	8330	7910	10445	5985		
18	25503	32287	30803	40686	24571		
19	98	156	264	419	95		
20	247	360	349	472	326		
21							
22			106	158			
23							
24	52	95	632	1075	167		
25	122	640	2384	4461	761		
26	561	2513	11656	21163	3120		
27	810	1853	16802	30297	4548		
28	31307	46564	65477	95909	48371		
29	554	1465	22727	29609	5568		
30	485	825	2171	3270	1096		
31	83	189	3156	5671	796		
32	5510	6791	6864	7200	6275		
33			46	75	47		
34			42	118			
35				47			
36		108	390	646	133		
37	51	159	1451	3005	441		
38	56	217	2226	4080	785		
39	233	940	13133	18618	3197		
40	2854	4160	7302	9585	4466		
41	203	1052	24327	26788	4334		
42	100	385	6699	11339	1492		
43	848	1664	21879	28569	5278		
44	897	2014	11089	22060	3058		
45	65	233	2899	5112	915		
46			175	310	68		
47				116			
48			77	180			
49		92	378	674			
50		232	1443	2341	84		
51		126	1290	2032	433		
52		93	922	1224	432		
53		187	3086	3625	198		
54		381	1154	1736	553		
55		327	12344	11907	238		
56		156	3957	9999	1185		
57	71	168	6044	6682	370		
58		45	2469	2704	926		
59			1080	1602	545		
60			118	434	344		
61			118	254			
62			91	252	48		
63			199	430	83		
64			116	238			
65		45	744	946	191		
66			327	840	133		
67		105	2464	2143	326		
68			818	780	81		
69		175	6870	4182	452		
70		40	2311	2005	183		
71			1093	959	166		
72	52	98	244	337	84		
73			108	297	63		
74			73	201			
75			53	68			
76			44	112			
77			580	688	224		
78			140	287	78		
79		40	552	775	174		
80			118	197	61		
81			1250	984	169		
82			506	421	82		
83			1827	994	118		
84			850	601			
85			297	299	43		
86				47			
87			146	161			
88				58			
89							
90							
91			148	296	112		
92			41	61			
93			101	175	67		
94			78	376			
95			429	327	68		
96			176	191			
97			280	193	47		
98			211	119			
99							
100				43			
101							
102							
103							
104							
105			42				
106							
107				52			
108							
109			75	56			
110							
111			47				
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Wornow Ink, Blue,
Cat. 20

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 6 pbw Catalyst
Cure: 1 hr. at 366°K (93°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 723°K (450°C)

a_o = 54.5% of initial weight

$$k = 1.25 \times 10^7 \exp\left(\frac{-24{,}200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.3×10^9	
373°K (100°C)	8.4×10^6	
423°K (150°C)	1.7×10^5	

Number and Relative Peak Intensity

Temperature, °K (°C)

Wornow Ink, Blue, Cat. 20

m/e	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
14	939	2180	1119	2864	1502		
15	118	5137	689	7563	1835		
16	1324	2387	1697	3564	2778		
17	4968	5218	5199	8995	4087		
18	18294	18654	17111	31713	14554		
19		1119	40	90			
20		41		56			
21							
22							
23							
24		163		189			
25							
26	95	6285	442	6986	1642		
27							
28	17567	29926	17088	32023	18386		
29	207	20210	909	7079	1490		
30	40		187	5416	305		
31		14294		3982			
32	3998	4227	3736	4006	3608		
33							
34							
35		40					
36							
37		141			78		
38			40		273		
39		4187	61	4755	1555		
40	457		470		976		
41		7870	95		589		
42			189	11580	512		
43		13106	271		668		
44	283		662	9488	767		
45		33558	537	4287	244		
46		618		264			
47		129		98			
48							
49				146			
50		985	46	1091	344		
51		1196		989	505		
52		357		707	108		
53		481		864	147		
54		60					
55		1029		2383	144		
56				2595	61		
57		8100	43		73		
58			165	7703	78		
59		12181	142	2057	40		
60		326		53			
61		138		66			
62		89					
63		402		329	218		
64					41		
65		626			477		
66		197		1842	413		
67		250		477			
68		50		306			
69		507					
70				1363			
71				471			
72		9567	47	398			
73		8399	52	135			
74		319		55			
75		173					
76							
77		803		225	492		
78		220		103	91		
79		257		184	126		
80				326	71		
81		55		148			
82		54		170			
83		109		176			
84				240			
85		2989		159			
86		71					
87		178					
88							
89		347			44		
90				41	42		
91		1634		91	610		
92		110		40	40		
93		58			46		
94				3647	674		
95				206			
96							
97		40					
98							
99							
100							
101		302					
102							
103		860			41		
104		84					
105		956			105		
106		121					
107				230	361		
108				196	92		
109							
110							
111							
112				42			
113							
114							
115		240					
116		306					
117		576					
118							
119		3381		43	60		
120		174			40		
121				47	172		
122							
123				41			
124							
125							
126							
127		43					

Number and Relative Peak Intensity (Continued)

Wornow Ink, Blue, Cat. 20

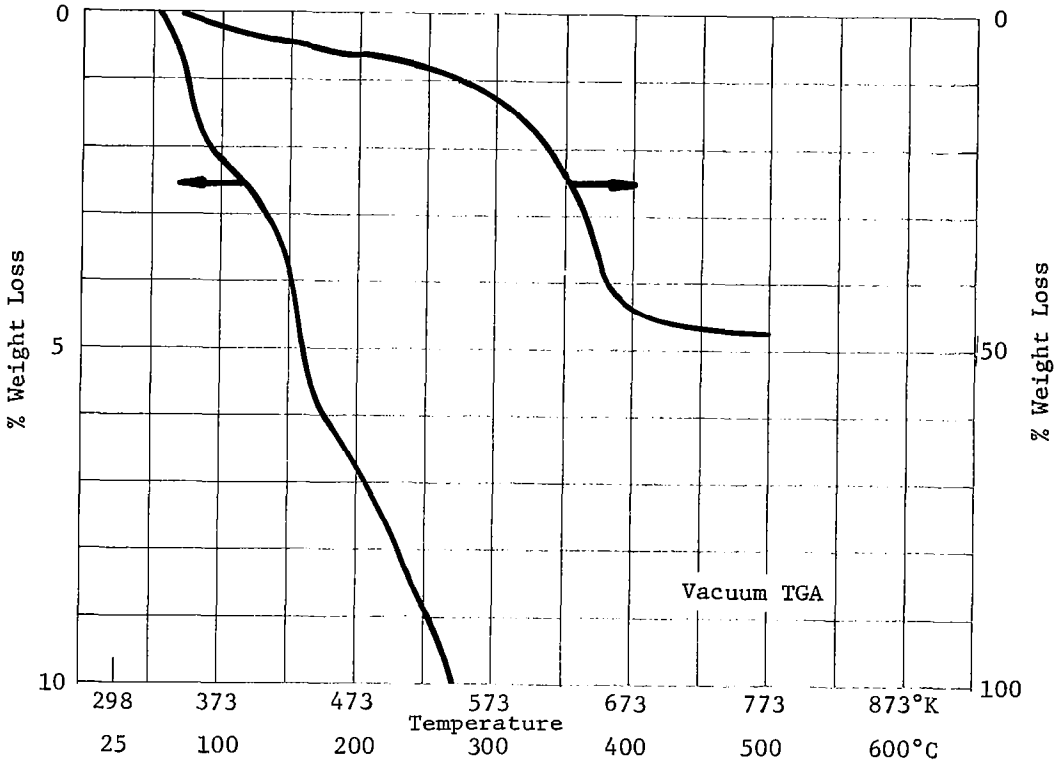
m/e	Temperature, ^{o}K (^{o}C)						
	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
128		174					
129		49					
130							
131		93			65		
132		58			40		
133		508					
134		720		44	43		
135					43		
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Wornow Ink, Orange,
Cat. 20

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 6 pbw Catalyst
Cure: 1 hr. at 366°K (93°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 723°K (450°C)

a_o = 24.8% of initial weight

$$k = 5.04 \times 10^{11} \exp\left(\frac{-34,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.6×10^{11}	
373°K (100°C)	3.2×10^{8}	
423°K (150°C)	1.2×10^{6}	

Number and Relative Peak Intensity

Temperature, ^{0}K (^{o}C)

Wornow Ink, Orange, Cat. 20

m/e	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
14	854	1433	1123	2830	2017		
15	59	2191	761	5698	4467		
16	1300	1784	2091	5201	6860		
17	5347	5909	6882	16782	7356		
18	19200	21331	23199	59964	25025		
19		282		159			
20				40			
21							
22							
23							
24		40		207	45		
25		313	43		289		
26		2646	670	7135	2627		
27							
28	14632	21964	17446	34751	22101		
29	45	8271	842	9670	1437		
30			454		378		
31		5580		7982			
32	3794	3716	3632	4086	3307		
33				40			
34							
35							
36				48			
37					167		
38		94					
39		1742		9595	2426		
40	226		468	4571	1191		
41		3279	189	5624	734		
42			620		427		
43		5321					
44	146		2078	12390	3376		
45		14378	881	3821	234		
46		135		815			
47				497			
48				44			
49							
50		283		2174	653		
51		455		2056	911		
52		77			204		
53		130		1464	296		
54					102		
55		294		4036	198		
56							
57		3172	46	5432	40		
58			327	1573	50		
59		4955	135	533			
60		77					
61				354	76		
62					147		
63		122		1497	436		
64							
65		198			894		
66		46		6739	844		
67		51		577	42		
68				277			
69		97		542			
70				1457			
71		60		209			
72		3784		396			
73		3251		173	40		
74		58		250			
75		48		93			
76				49			
77		256		817	757		
78		57		228	221		
79		61		500	287		
80				123	46		
81				90			
82				71			
83				560			
84		44		211			
85		868					
86							
87							
88							
89		77		61	75		
90				62	73		
91		499		763	910		
92				52	100		
93				42			
94				11552	1231		
95				602			
96							
97							
98				55			
99							
100							
101							
102							
103		177		52			
104		40					
105		258		50	109		
106							
107				605	950		
108				244	375		
109							
110							
111				47			
112				59			
113							
114							
115							
116		73			40		
117		165					
118							
119		1570		603	66		
120		59					
121				213			
122				51	89		
123				66			
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

Wornow Ink, Orange, Cat. 20

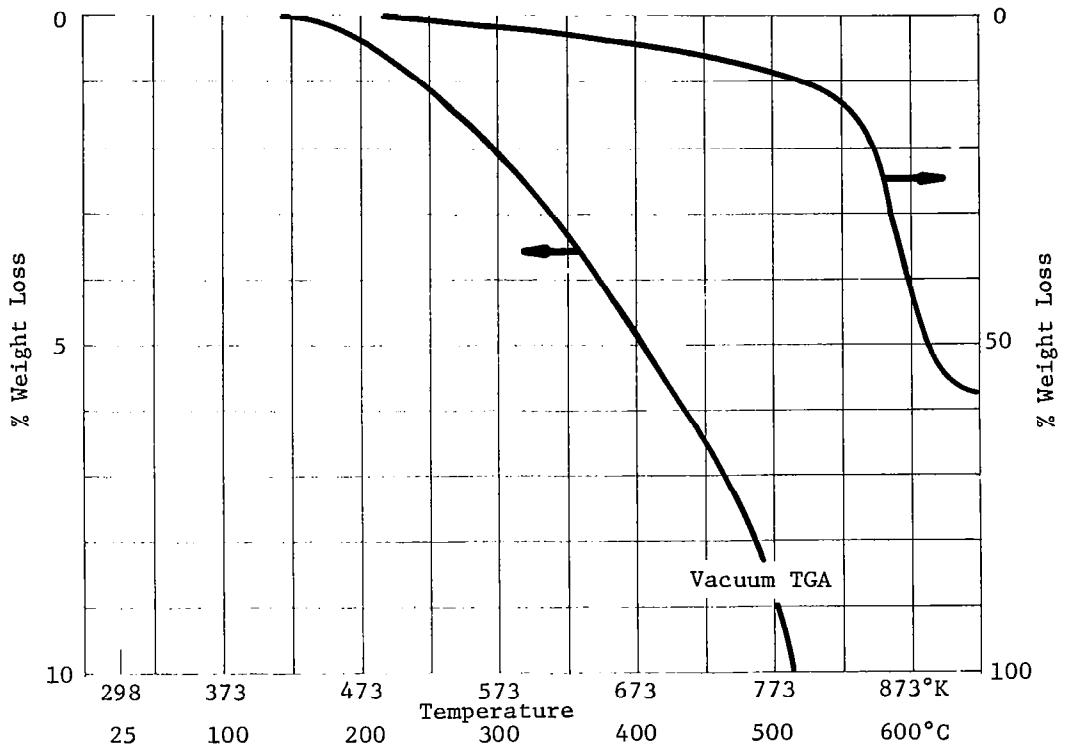
Temperature, °K (°C)

m/e	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)		
128		58					
129							
130							
131		49		60	77		
132				57	45		
133		171		55			
134				781	41		
135		205					
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165				259			
166							
167		89					
168				43			
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: One Component
Cure: 4 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 773°K (500°C) - 923°K (650°C)

a_o = 48.7% of initial weight

$$k = 1.96 \times 10^{24} \exp\left(\frac{-97,300}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.4×10^{41}	
373°K (100°C)	4.7×10^{32}	
423°K (150°C)	8.2×10^{25}	

Isothermal weight loss in nitrogen = 0.11%

Aluminized Silicone Coating

Number and Relative Peak Intensity

Temperature, °K (°C)

m/e	298 (25)	573 (300)	773 (500)	823 (550)
14	2725	2821	3655	340
15	1113	1719	5066	471
16	7080	6652	9918	1081
17	25461	20128	17780	1786
18	84388	64674	54851	5582
19	1830	2051	1450	470
20	698	752	911	206
21				
22		41		
23	69	56		
24		104	767	708
25	71	377	916	54
26	496	1842	4431	508
27	792	2160	4527	535
28	32331	35629	38099	5981
29	567	1660	1754	116
30	683	889	1241	
31		360	21886	31197
32	7497	6623	6323	936
33				
34	42	46		
35				
36	74	141	255	
37		310	821	
38	55	448	1259	
39	223	1198	4203	213
40	4769	5190	7123	1568
41	156	665	1893	
42	114	572	894	
43	175	1239	1241	520
44	1539	3693	1587	236
45	58	239	204	
46		51	73	
47			46	
48			65	
49		169	458	
50		990	10369	10887
51		961	3173	312
52		856	1984	91
53		129	534	
54		64	203	
55		411	444	
56		515	247	
57		124	168	
58		106	115	
59				
60			65	
61		43	208	
62		52	742	356
63		176	1064	
64	78	84	302	
65	57	101	1002	
66	103	145	503	
67	49	82	337	
68		56	125	
69		48	1253	1590
70		45	87	
71			41	
72		51	51	
73		73	155	
74		181	555	
75		72	272	
76		173	416	
77		638	2069	88
78	47	2765	6096	523
79		203	784	
80				
81		41	13882	18534
82		51	368	320
83		49	70	
84	169	190	254	
85			67	
86		56	97	
87			64	
88				
89			216	
90			100	
91		41	2500	111
92			913	
93			133	
94		57	349	
95				
96				
97				
98				
99				
100			5530	7199
101			123	64
102			69	
103			261	
104			220	
105			559	
106			294	
107			343	
108			154	
109				
110				
111				
112				
113				
114				
115			196	
116			57	
117			223	
118			136	
119			102	
120			87	
121			112	
122			43	
123				
124				
125				
126				
127				

Number and Relative Peak Intensity (Continued)

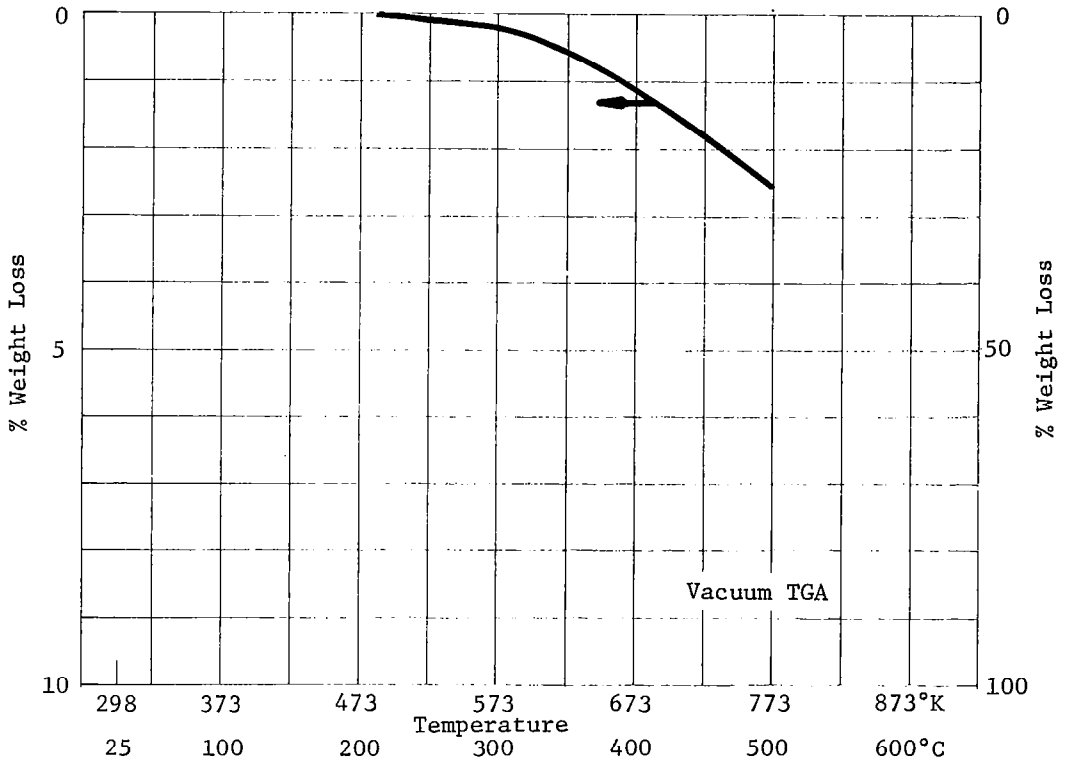
Aluminized Silicone Coating

m/e	Temperature, °K (°C) 298 (25)	573 (300)	773 (500)	823 (550)			
128			82				
129		178	284				
130			50				
131		115	419	197			
132	152	149	256				
133							
134	46	59	94				
135							
136		44	59				
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148'							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, ^{0}K (^{o}C) — Cho-Seal 1030

m/e	298 (25)	673 (400)	773 (500)				
14	2962	3178	5432				
15	1309	2440	8608				
16	7549	7494	8882				
17	24904	19300	17068				
18	82163	62490	53136				
19	1604	1590	1524				
20	738	744	712				
21							
22							
23							
24		40	164				
25	89	212	728				
26	711	1180	3380				
27	989	1144	2058				
28	40874	39246	42248				
29	616	958	1627				
30	825	973	999				
31	75	155	172				
32	9270	8366	7326				
33							
34							
35							
36	52	68	78				
37			54				
38	55	57	118				
39	185	234	382				
40	6065	6104	5862				
41	133	224	307				
42	122	168	267				
43	164	238	449				
44		2466	2006				
45		196	950				
46			52				
47		57	214				
48							
49							
50	49	103	79				
51	44	58	84				
52			45				
53							
54							
55			55				
56			42				
57			40				
58			72				
59			567				
60			47				
61			391				
62							
63							
64	72	77					
65	64	79	70				
66	75		107				
67			57				
68							
69							
70							
71			44				
72							
73		130	2787				
74			294				
75		410	1146				
76			63				
77		40	122				
78	47	65	103				
79							
80							
81			234				
82			147				
83							
84	155	169	163				
85							
86			42				
87			242				
88			129				
89			410				
90							
91			41				
92							
93							
94							
95							
96		151	2358				
97							
98							
99							
100							
101							
102			46				
103			431				
104			71				
105			103				
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			158				
116							
117			61				
118							
119			298				
120							
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

Cho-Seal 1030

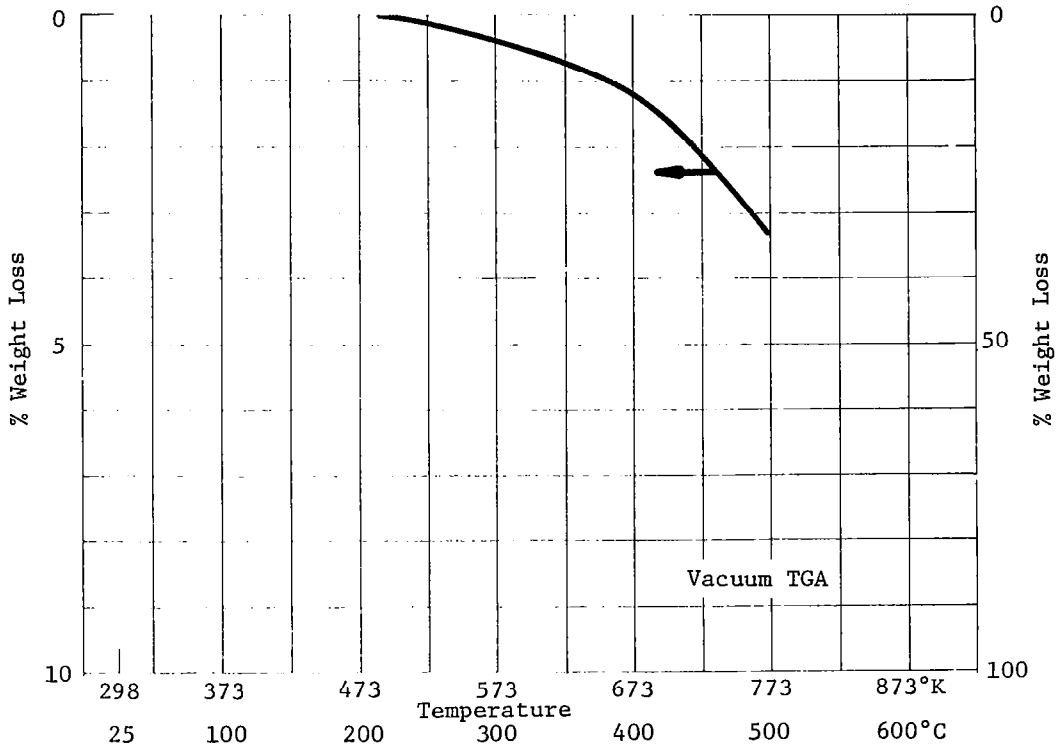
m/e	Temperature, °K (°C) 298 (25)	673 (400)	773 (500)				
128							
129	144	147	118				
130							
131	96	92	105				
132	128	100	177				
133			641				
134			100				
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			43				
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Cho-Seal 1030 with
Chomerics Primer

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C)

Cho-Seal 1030 with Chomerics Primer

m/e	298 (25)	673 (400)	773 (500)				
14	2907	3352	5179				
15	1270	2641	7962				
16	8419	7930	8802				
17	25533	19133	16252				
18	82941	59732	49441				
19	744	781	793				
20	712	678	596				
21							
22							
23							
24			111				
25		142	596				
26	484	1183	3142				
27	901	1164	1979				
28	40075	38564	39644				
29	517	835	1331				
30	974	957	995				
31		41	59				
32	9390	8135	6763				
33							
34							
35							
36							
37							
38			74				
39	57	173	397				
40	6757	6399	6080				
41	53	160	247				
42	46	97	149				
43	82	171	295				
44	1756	2520	2052				
45		94	676				
46							
47			62				
48							
49							
50		40	135				
51			182				
52			73				
53							
54							
55							
56							
57							
58							
59			342				
60							
61			183				
62							
63							
64							
65							
66			40				
67							
68							
69							
70							
71							
72							
73		161	2593				
74			238				
75		99	724				
76							
77			135				
78		58	405				
79							
80							
81			88				
82							
83							
84	72	87	80				
85							
86							
87			73				
88							
89			176				
90							
91			78				
92							
93							
94							
95							
96		104	1370				
97			81				
98							
99							
100							
101							
102							
103			219				
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119			104				
120							
121							
122							
123							
124							
125							
126							
127							

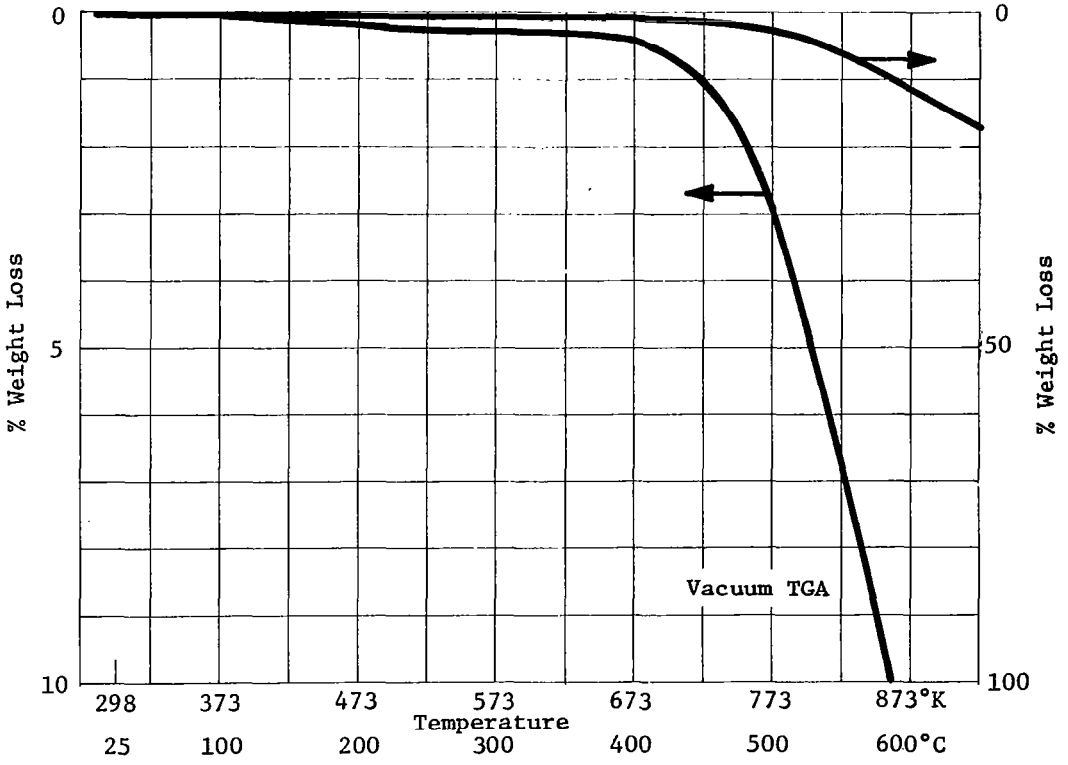
Number and Relative Peak Intensity (Continued)

Cho-Seal 1030 with Chomerics Primer

m/e	Temperature, °K (°C)						
	298 (25)	.673 (400)	773 (500)				
128							
129	73	73	51				
130							
131							
132	56		57				
133			316				
134							
136							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received, Postcured 24 hrs. at 450°K (177°C) at 1×10^{-3} Torr
1. TGA Preconditioning: 100 hrs. at 398°K (125°C) in N_2 atmosphere



2. Activation Energy of Decomposition:

Over the Range: 603°K (330°C) - 993°K (720°C)

a_o = 19% of initial weight

$$k = 2.0 \times 10^5 \exp\left(\frac{-24{,}000}{1.98\ T°K}\right)\ min^{-1}$$

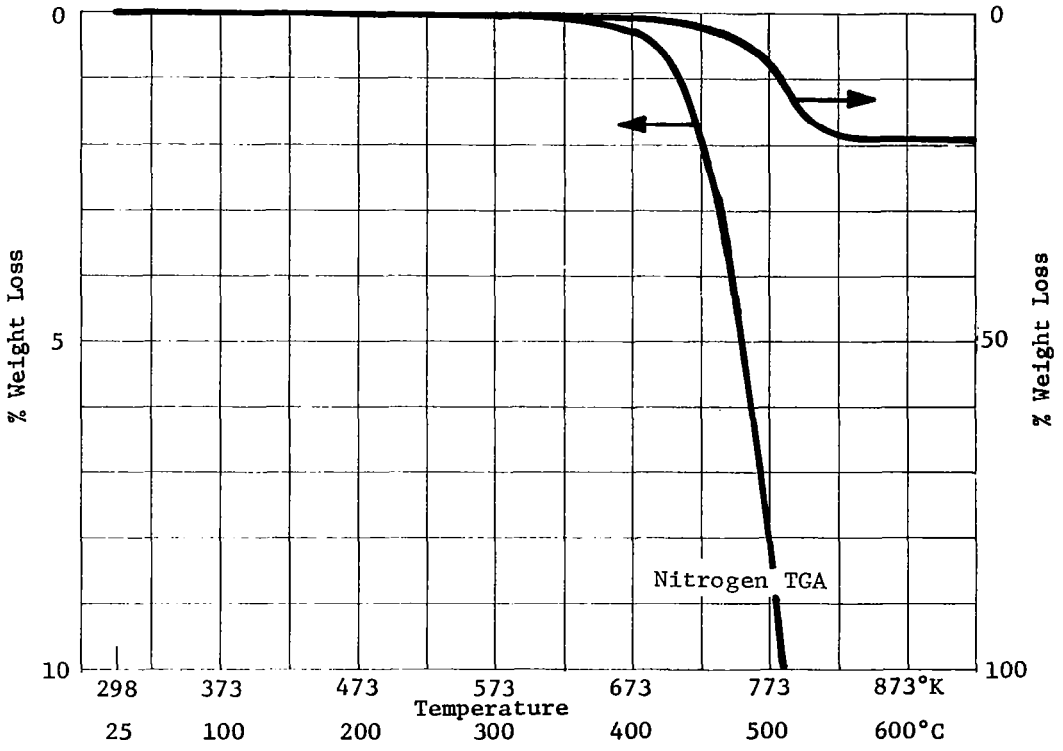
Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	6.0×10^{10}	
373°K (100°C)	4.0×10^{8}	
423°K (150°C)	8.2×10^{6}	

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received, Postcured 24 hrs. at 450°K (177°C) at 1×10^{-3} Torr

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 933°K (660°C)

a_o = 19% of initial weight

$$k = 1.5 \times 10^{10} \exp\left(\frac{-38{,}200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		5.5×10^{13}
373°K (100°C)		1.2×10^{10}
423°K (150°C)		2.5×10^{7}

Number and Relative Peak Intensity

Temperature, °K (°C)

Cho-Seal 1224

m/e	298 (25)	423 (150)	623 (350)	698 (425)	773 (500)	873 (600)	
14	650	623	657	710	968	1130	
15		186	198	389	1195	1635	
16	2957	2787	2704	2606	2736	2893	
17	11078	9389	8242	7744	6880	6645	
18	35697	29180	24885	22677	20236	18964	
19	45	54	51	42	55	81	
20	94	86	82	102	70	78	
21							
22							
23							
24						44	
25				44	71	113	
26	44	65	66	166	570	728	
27				250	405	502	
28	8126	7844	7814	7766	8019	8303	
29	76	88	92	127	226	275	
30	737	760	759	745	701	671	
31							
32	2429	2324	2180	2016	1850	1783	
33							
34							
35							
36							
37							
38							
39				52	75	96	
40	1189	1177	1220	1154	1096	1122	
41				51	60	52	
42						45	
43			41	59	58	87	
44	473	496	495	462	414	394	
45					66	175	
46							
47							
48							
49							
50							
51					43	51	
52					41	54	
53						48	
54							
55							
56							
57							
58							
59							
60					50	118	
61						53	
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74					268	894	
75						67	
76					48	99	
77							
78						56	
79					81	130	
80							
81							
82						50	
83							
84							
85							
86							
87							
88							
89				45			
90						56	
91							
92						47	
93							
94							
95							
96							
97				49	160	359	
98							
99							
100							
101							
102							
103							
104						44	
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Table 1 Tensile Strength and Elongation* (ASTM D412-68)

Exposure	Average		High		Low		Samples Tested
	Pa x 10^{-6}	psi	Pa x 10^{-6}	psi	Pa x 10^{-6}	psi	
Baseline	2.15 @ 498%	312 @ 498%	2.40 @ 498%	348 @ 560%	2.07 @ 498%	300 @ 440%	5
Heat Compatibility	2.07 @ 291%	300 @ 291%	2.36 @ 320%	342 @ 320%	288 @ 270%	1.99 @ 498%	5

*Postcured 24 hours at 450°K (177°C) at 1 x 10^{-3} Torr

(1) Heat compatibility - 379 hours at 408°K (135°C) in an N_2 atmosphere

Table 2 Solvent Resistance* (ASTM D471-66)

Solvent	Exposure	Hardness, Shore A (1)		Samples Tested
		Before	After	
Freon TMS	Baseline	60	55	1
	Heat Compatibility (2)	63	55	1
Trichloro-ethane 1-1-1	Baseline	59	55	1
	Heat Compatibility (2)	62	55	1
Methyl Ethyl Ketone	Baseline	58	55	1
	Heat Compatibility (2)	62	55	1

*Postcured for 24 hours at 450°K (177°C) at 1 x 10^{-3} Torr

(1) One hour after removal from the solvent.

(2) Solvent exposure after 379 hours at 408°K (135°C) in N_2 atmosphere.

Table 3 Hardness* (Shore A) (FTMS 601 Method 3021)

Exposure	Average	High	Low	Samples Tested
Baseline	60	63	59	5
Heat Compatibility (1)	59	60	57	5

Table 4 Compression Set* (ATSM D395-61)

Baseline	6.20%	8.78%	2.11%	3
Heat Compatibility (1)	13.14%	13.80%	11.84%	3
Heat Compatibility Plus Thermal Vacuum (1) (2)	10.39%	10.77%	9.80%	3

*Postcured 24 hours at 450°K (177°C) at a pressure of 1 x 10^{-3} Torr

(1) Heat compatibility - 379 hours at 408°K (135°C) in an N_2 atmosphere.

(2) Tested as a pressure of 1 x 10^{-5} Torr after 37 days at 338°K (65°C) at a pressure of 1 x 10^{-6} Torr.

Table 5 Volume Resistivity* (ASTM D257)

Exposure	High	Low	Average	Samples Tested
Baseline	9.8×10^{-4}	3.0×10^{-4}	6.2×10^{-4}	3
Heat Compatibility (1)	8.0×10^{-4}	4.9×10^{-4}	5.9×10^{-4}	3
Thermal Vacuum (2)	4.9×10^{-4}	4.5×10^{-4}	4.8×10^{-4}	3

*Postcured at 24 hours at $450^{o}K$ ($177^{o}C$) at 1×10^{-3} Torr

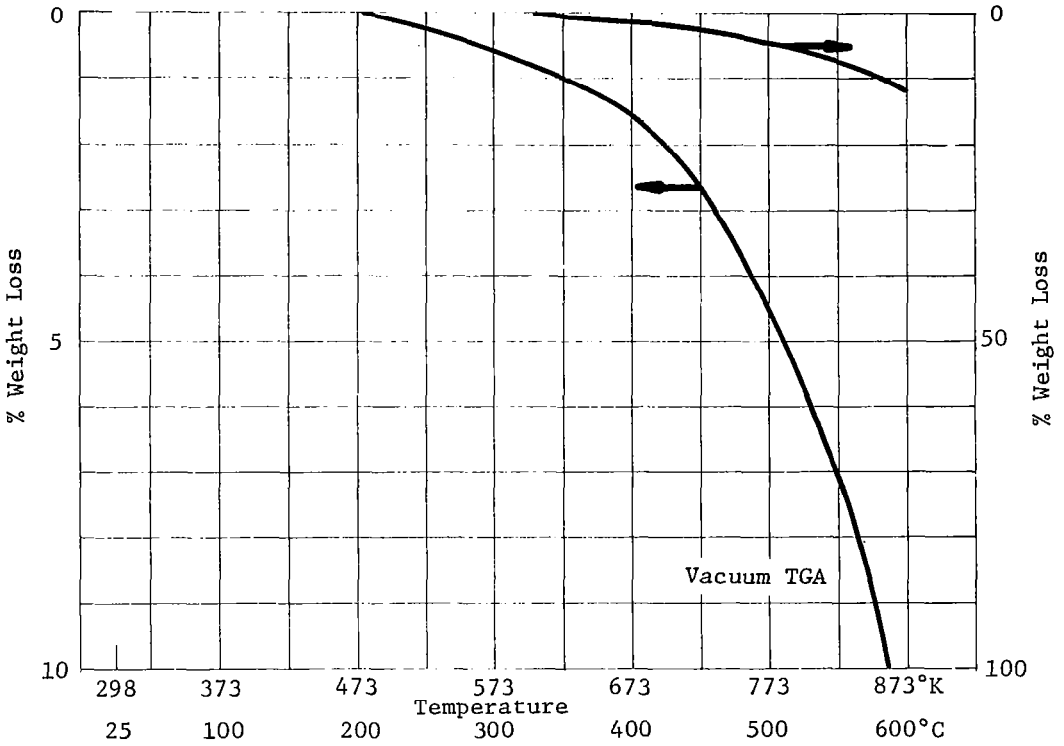
(1) Heat compatibility - 379 hours at $408^{o}K$ ($135^{o}C$) in N_2 atmosphere.

(2) Thermal vacuum - Tested at 1×10^{-5} Torr after 37 days at $338^{o}K$ ($65^{o}C$) and 1×10^{-6} Torr.

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, ^{o}K (^{o}C)

Cho-Seal 1250

m/e	298 (25)	673 (400)	773 (500)	873 (600)			
14	2882	3285	5917	6342			
15	918	2583	9671	11392			
16	7215	7221	8589	10077			
17	22815	18398	15648	16309			
18	76994	60471	50473	52004			
19	397	433	482	567			
20	505	455	482	513			
21							
22							
23							
24			95	143			
25		96	677	814			
26	376	1193	3733	4474			
27	714	1075	2119	2626			
28	39266	37831	39418	41652			
29	448	747	1399	1641			
30	647	728	764	789			
31				61			
32	9903	8342	6766	6707			
33							
34							
35							
36							
37							
38			65	84			
39		139	504	478			
40	5007	4826	4740	4893			
41		119	248	300			
42		78	156	180			
43	44	117	302	485			
44	1517	2511	2086	2870			
45		62	864	1148			
46							
47			69	129			
48							
49							
50			147	108			
51			206	124			
52			80	42			
53							
54							
55							
56							
57							
58							
59			437	711			
60							
61			229	431			
62							
63							
64							
65							
66				41			
67							
68							
69							
70							
71							
72							
73		163	3556	3821			
74			296	344			
75		51	963	1114			
76							
77			141	118			
78		58	544	337			
79							
80							
81			95	261			
82				100			
83							
84	47						
85							
86							
87			93	217			
88				83			
89			217	534			
90							
91			109	123			
92							
93							
94							
95							
96		158	2024	3431			
97			67				
98							
99							
100							
101							
102							
103			299	589			
104							
105				74			
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			50	181			
116							
117							
118							
119			198	402			
120							
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

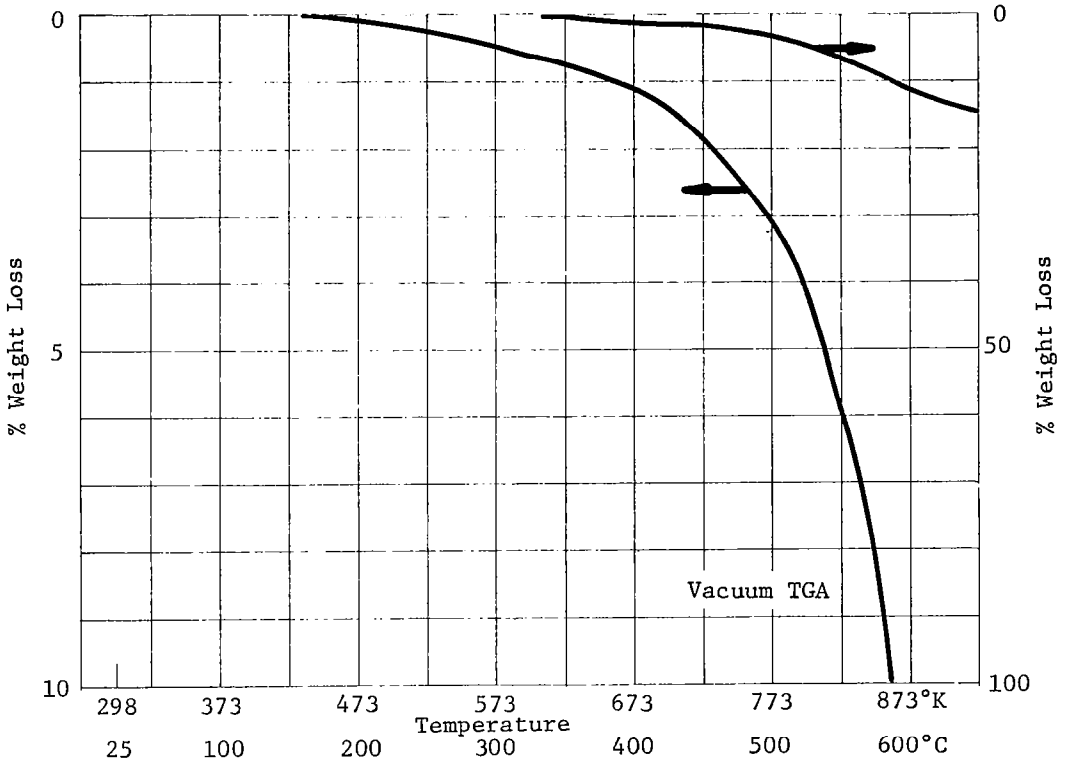
	Temperature, °K (°C)				Cho-Seal 1250		
m/e	298 (25)	673 (400)	773 (500)	873 (600)			
128							
129	55			60			
130							
131				42			
132	47		40	97			
133			624	1033			
134				79			
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Cho-Seal 1250 with
Chomerics Primer

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $623^{o}K$ ($350^{o}C$) - $973^{o}K$ ($700^{o}C$)

a_o = 14.1% of initial weight

$$k = 1.34 \times 10^{6} \exp\left(\frac{-26,800}{1.98\ T^{o}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	6.8×10^{11}	
$373^{o}K$ ($100^{o}C$)	2.5×10^{9}	
$423^{o}K$ ($150^{o}C$)	3.4×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Cho-Seal 1250 with Chomerics Primer

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	3242	3406	5906	6696	5569		
15	1563	2762	9539	12597	9346		
16	11235	10191	11333	12846	12333		
17	41312	28067	23835	22269	22504		
18	100570	80040	73934	67544	69339		
19	253	313	326	433	489		
20	961	814	712	750	747		
21							
22							
23							
24		45	192	200	157		
25	100	236	759	877	559		
26	578	1230	3749	4021	2882		
27	972	1308	2514	2889	2392		
28	38395	36650	39062	40790	39285		
29	567	851	1671	1739	1401		
30	1240	1287	1402	1229	1185		
31	103	104	152	162	142		
32	10522	8522	7160	6854	7130		
33							
34	42			43			
35							
36							
37			125	80	59		
38	41	69	186	148	113		
39		303	653	621	501		
40	7577	7268	6883	7015	7092		
41	125	286	412	450	488		
42	134	220	273	303	303		
43	126	228	443	557	489		
44	2065	3129	2813	3471	3342		
45		118	768	1112	659		
46			46	78	44		
47			152	217	125		
48							
49			54				
50		76	281	201	90		
51		62	309	214	87		
52		49	242	139	67		
53			42	61	59		
54							
55			62	95	131		
56			44	57	76		
57				73	41		
58			47	99	69		
59			448	665	420		
60				45			
61			309	490	242		
62							
63			68	80			
64	111	82			82		
65		113	112	119			
66	147	117	142	164	145		
67	52		144	61	46		
68							
69							
70					41		
71				53			
72				71	44		
73		121	2273	3130	1451		
74			289	400	179		
75		98	908	1136	595		
76			81	79			
77			279	208	84		
78		148	800	48	184		
79			49				
80							
81			204	293	166		
82			136	203	104		
83	42		51	51	62		
84	210	214	219	213	199		
85							
86	59		50	72	50		
87			173	299	134		
88			96	152	69		
89			341	536	278		
90							
91			204	213	73		
92			46	53			
93							
94							
95							
96		185	1900	2913	1468		
97							
98							
99							
100							
101							
102			45	64			
103			393	547	265		
104			82	109	43		
105			108	148	71		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			188	252	101		
116							
117			60	114			
118							
119			285	450	203		
120							
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

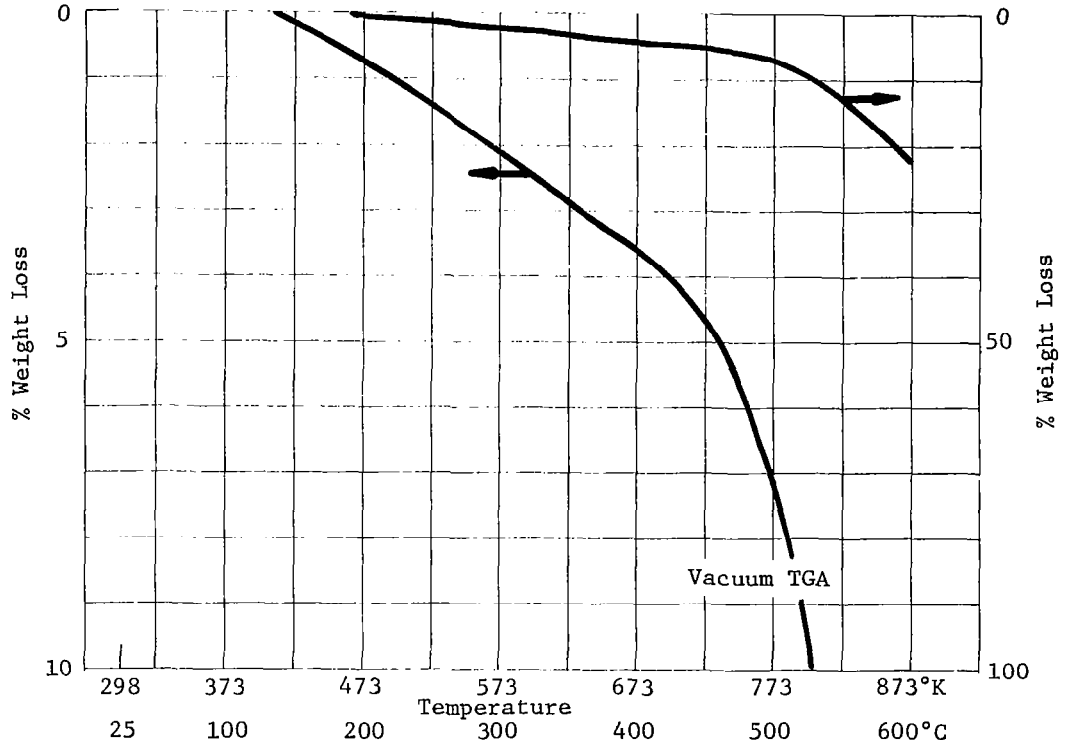
Cho-Seal 1250 with Chomerics Primer

m/e	Temperature, °K (°C) 298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	284	245	227	234	239		
130							
131	202	172	185	190	175		
132	256	197	246	268	220		
133			700	980	461		
134	78	74	142	170	112		
135			58	56			
136	50		42	46			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			65	111	51		
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C)

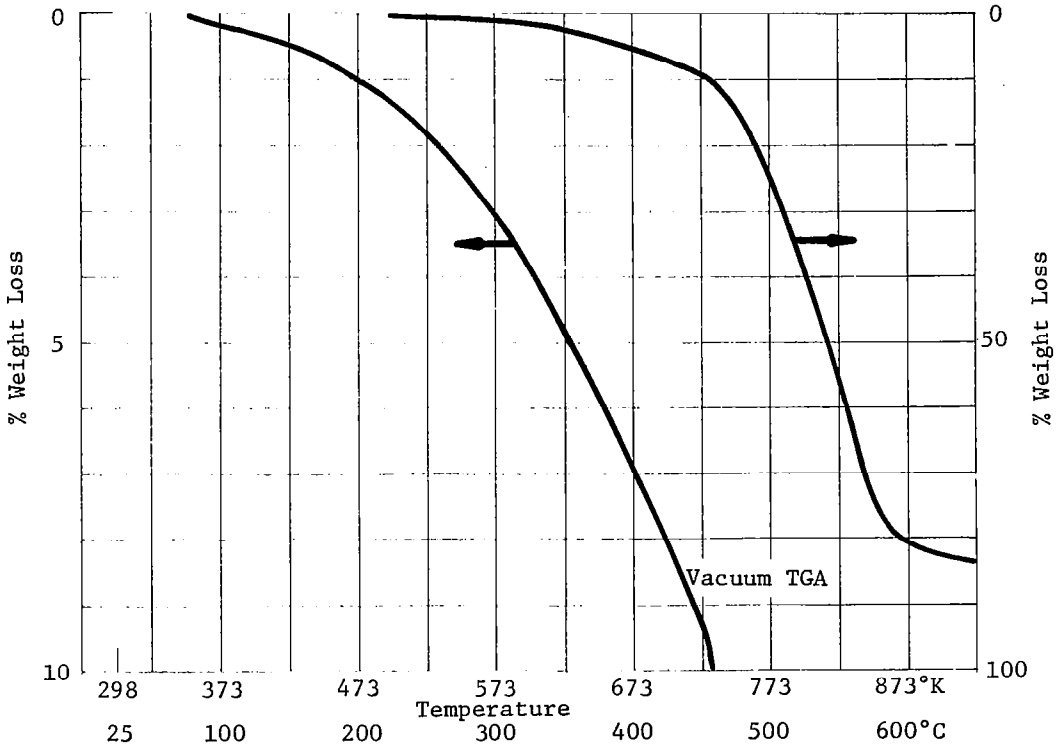
Consil, Tecknit EMI/RFI Shielding Gasket

m/e	298 (25)	473 (200)	673 (400)	873 (600)			
14	493	505	565	2081			
15	139	164	393	5207			
16	3365	3468	3489	6385			
17	11064	10461	9417	9146			
18	32826	30235	26524	24461			
19							
20	54	48		46			
21							
22							
23							
24				69			
25				268			
26	62	55	195	2295			
27	175	181	253	1375			
28	9789	10075	10248	15110			
29	50	64	110	590			
30	921	956	914	978			
31				49			
32	2490	2538	2454	2354			
33							
34							
35							
36							
37				43			
38				55			
39			53	214			
40	1234	1318	1259	1529			
41			54	99			
42				72			
43			48	140			
44	219	273	305	371			
45				607			
46							
47				78			
48							
49							
50				68			
51				74			
52				53			
53							
54							
55							
56							
57							
58							
59				377			
60							
61				167			
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73				3332			
74				180			
75				288			
76							
77				68			
78				106			
79							
80							
81				54			
82							
83							
84							
85							
86							
87				45			
88							
89				83			
90							
91				53			
92							
93							
94							
95							
96				949			
97				48			
98							
99							
100							
101							
102							
103				45			
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $423^{o}K$ ($150^{o}C$) - $973^{o}K$ ($700^{o}C$)

a_o = 85.3% of initial weight

$$k = 2.85 \times 10^{3} \exp\left(\frac{-16,900}{1.98\ T^{o}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	6.7×10^{7}	
$373^{o}K$ ($100^{o}C$)	1.91×10^{6}	
$423^{o}K$ ($150^{o}C$)	1.27×10^{5}	

Number and Relative Peak Intensity

Temperature, °K (°C)

DC-11 Silicone Grease

m/e	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)	923 (650)	
14	3800	3712	3784	4085	11584	8003	
15	1773	2020	2125	3042	30280	15041	
16	12716	12300	12244	11871	20421	15469	
17	44636	38236	36355	31663	27100	24313	
18	100811	100874	100899	95183	75716	64539	
19	346	378	416	402	545	415	
20	918	869	899	832	877	781	
21							
22							
23							
24		42	49	90	823	356	
25	135	193	160	324	2791	1165	
26	911	1084	995	1765	12635	5649	
27	1633	1713	1745	2078	8673	4468	
28	48503	47951	48566	47449	67293	49452	
29	719	764	843	1076	6735	2754	
30	2351	2349	2587	2457	2778	2190	
31			122	133	791	278	
32	12121	11243	11168	10336	8945	7862	
33					44		
34	54	48			67	79	
35							
36					98	68	
37				43	220	101	
38	46	58	54	79	337	177	
39	191	241		294	1258	721	
40	7749	7917	8086	7831	8403	7766	
41	182	277	265	303	1038	704	
42	141	183	163	194	798	415	
43	185	250	243	280	2638	963	
44	2515	2752	2794	2646	2843	2295	
45	65	84	74	257	8880	2596	
46					509	135	
47				55	1411	438	
48					90	67	
49					78		
50		48	48	75	228	113	
51		41	45	47	248	108	
52		44			209	69	
53					203	92	
54					95	40	
55		63	48	54	388	203	
56		41	42	43	144	113	
57					404	115	
58					727	183	
59				103	6112	1645	
60					602	134	
61				113	4161	1054	
62					248	49	
63					234	68	
64	60	85	75	63	86	97	
65						101	
66	80	113	86	79	441	165	
67			41		193	74	
68					59		
69					97		
70					71		
71					630	117	
72						177	
73	115	225	48	507	37111	10896	
74				48	4289	1128	
75				208	7757	2124	
76					558	115	
77				44	535	156	
78	44	41	43	60	211	114	
79				47	105	86	
80					182		
81				70	2485	581	
82				58	1633	326	
83						79	
84	154	143	141	147	244	167	
85					518	115	
86					216	77	
87				58	2920	652	
88					1671	359	
89				79	4387	1058	
90					480	94	
91					332	96	
92							
93							
94					42		
95							
96			46	596	25098	5551	
97				130			
98						77	
99					49		
100							
101					212		
102					767	140	
103				97	5389	1195	
104					1242	225	
105					1581	311	
106					156		
107					169		
108							
109							
110					83		
111					179		
112					74		
113					63		
114							
115					2639	519	
116					381	54	
117					1318	247	
118					466	74	
119				78	4335	837	
120					463	73	
121					491	69	
122							
123							
124							
125					496	44	
126					96		
127							

Number and Relative Peak Intensity (Continued)

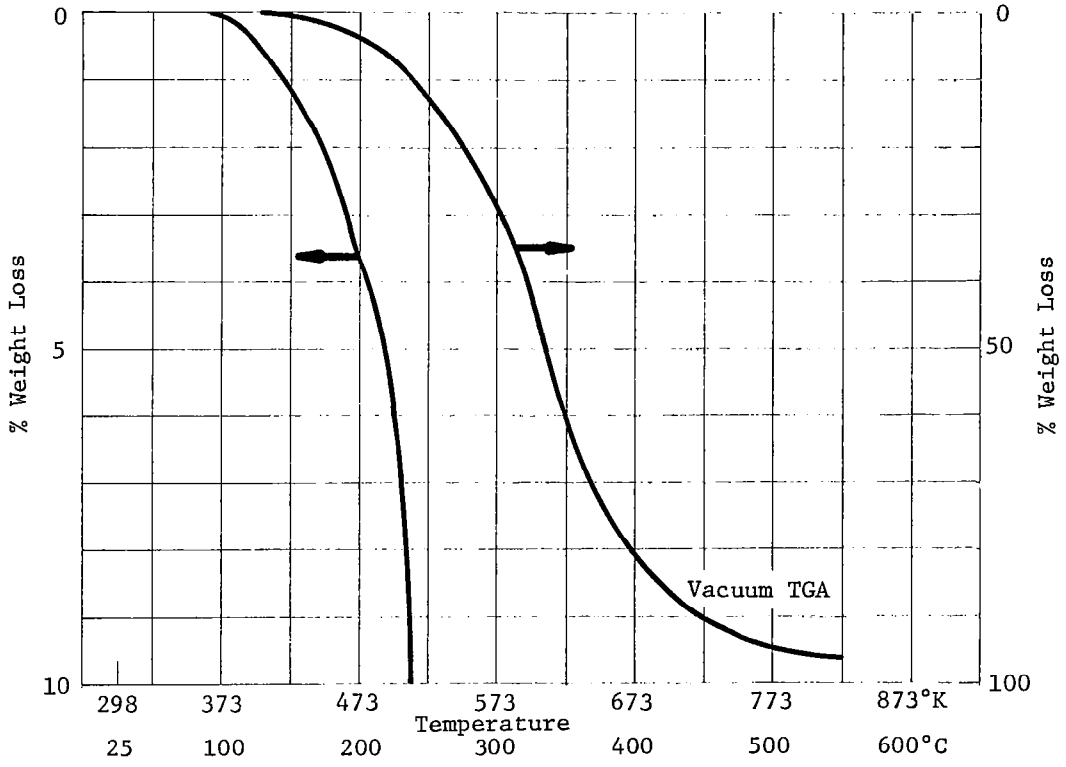
	Temperature, °K (°C)					DC-11 Silicone Grease	
m/e	298 (25)	423 (150)	523 (250)	623 (350)	773 (500)	923 (650)	
128							
129	182	199	201	175	249	184	
130							
131	121	127	148	94	460	169	
132	151	168	178	167	638	227	
133				206	9533	1773	
134		57	52	60	1412	257	
135					771	110	
136		41			73		
137							
138							
139							
140							
141							
142							
143							
144							
145					86		
146					78		
147					1485	253	
148'					199		
149					385	53	
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161					261		
162					56		
163					500	42	
164					49		
165					152		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177					274		
178							
179					41		
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191					110		
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208					102		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

DC-33 Silicone Grease
Light

Chemical Characterization Summary

Mix Ratio: One Component
Cure: None

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 323°K (50°C) - 798°K (525°C)

a_o = 95.0% of initial weight

$$k = 4.32 \times 10^{2} \exp\left(\frac{-10,550}{1.98\ T°K}\right) \ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	2.0×10^{4}	
373°K (100°C)	2.2×10^{3}	
423°K (150°C)	4.1×10^{2}	

Number and Relative Peak Intensity

Temperature, ^{o}K (^{o}C)

DC-33 Silicone Grease
Light

m/e	298 (25)	423 (150)	573 (300)	673 (400)	773 (500)	823 (550)	
14	3074	3156	9152	6269	5405	5499	
15	1566	1901	18115	11702	10939	10419	
16	9473	8709	10042	12391	11322	10721	
17	33086	26434	19402	20813	21560	22062	
18	100550	87296	60868	63778	65356	65731	
19	270	279	264	195	177	186	
20	710	677	605	627	662	683	
21							
22							
23							
24			96	48			
25			369	240	214	235	
26	298	378	2185	1717	1472	1370	
27	816	874	3091	4448	3129	2666	
28	34718	32567	33030	34539	35372	35913	
29	528	628	1993	4137	2736	2177	
30	1049	1052	945	932	927	898	
31			192	160	236	251	
32	9522	8477	6046	6555	6933	7243	
33							
34							
35							
36							
37			156	177	146	102	
38			290	320	232	194	
39		109	831	2408	1255	944	
40	5877	5738	5167	6064	6038	6093	
41	79	112	370	4445	1491	948	
42	84	80	251	1911	666	429	
43	124	133	989	5741	2083	1471	
44	1633	1623	2107	7819	3141	2267	
45		49	2692	1990	3170	2712	
46			110	122	158	116	
47			284	252	644	502	
48							
49			84	50	62	72	
50			661	499	526	397	
51			1034	826	894	729	
52			542	464	439	332	
53			70	309	212	125	
54				226	102	49	
55			94	1702	659	363	
56				1680	412	237	
57			135	3046	883	421	
58			205	317	208	171	
59			1836	1073	1714	1529	
60			120	66	170	114	
61			1064	642	1231	915	
62			87		76	52	
63			156	130	189	162	
64	63	67	61		79	76	
65			203	226	361	297	
66	67	56	218	155	210	155	
67			67	229	231	135	
68				122	76	42	
69				595	219	99	
70				801	163	87	
71			160	1240	478	249	
72				174	208		
73		67	15937	7935	11805	11348	
74			1925	861	1279	1204	
75		49	3624	1595	3406	2532	
76			270	142	276	206	
77			860	587	870	796	
78		43	1773	1380	1297	1103	
79			143	145	195	151	
80					43		
81			567	348	699	510	
82			263	283	385	304	
83			69	308	203	136	
84	148	134	146	460	212	224	
85			170	656	261	174	
86			74	85	68	67	
87			659	366	723	560	
88			289	179	371	253	
89			865	600	1178	914	
90			72	40	125	101	
91			1084	847	1508	1219	
92			106	72	162	133	
93							
94							
95							
96			4419	2809	5915	4542	
97				445			
98				91	48		
99				60			
100							
101					52		
102			99	100	168	116	
103			1026	675	1457	1083	
104			251	127	273	189	
105			394	265	535	420	
106							
107			40		65	46	
108							
109							
110							
111							
112							
113							
114							
115			470	246	577	456	
116			52		53		
117			279	109	291	218	
118			80	41	69	55	
119			853	519	1074	848	
120			77	48	123	77	
121			61	54	114	63	
122							
123							
124							
125			182		56	53	
126							
127			369	203	495	338	

Number and Relative Peak Intensity (Continued)

DC-33 Silicone Grease
Light

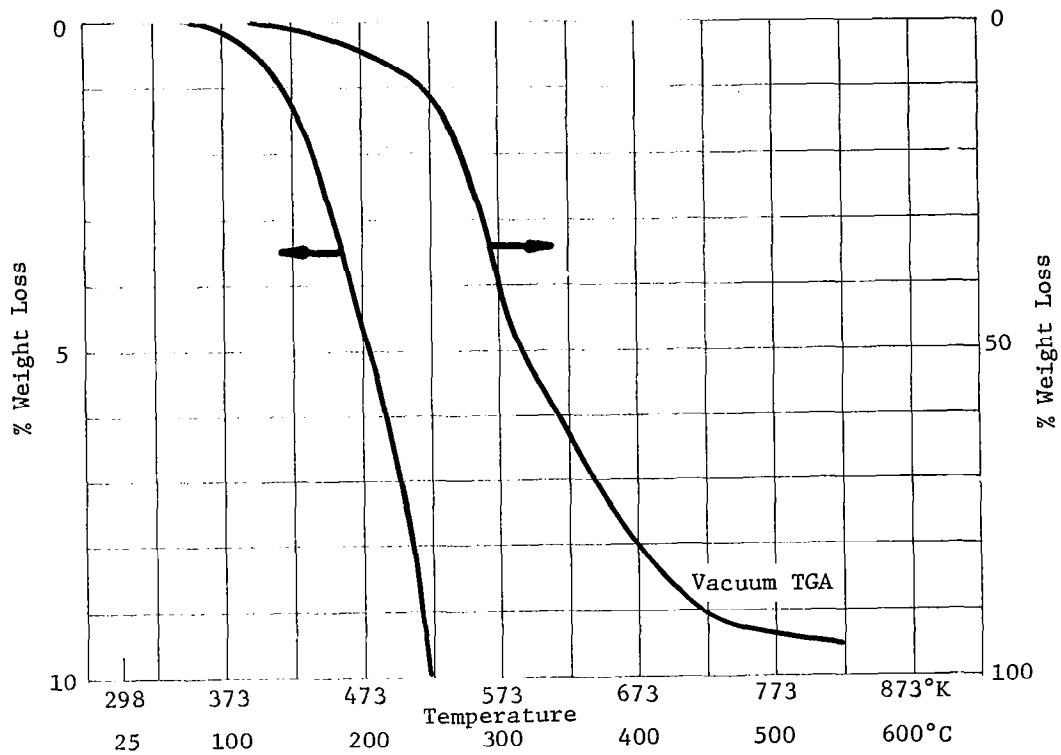
m/e	Temperature, °K (°C)						
	298 (25)	423 (150)	573 (300)	673 (400)	773 (500)	823 (550)	
128			54		85	56	
129	132	107	162	146	173	181	
130							
131	94	93	160	121	174	168	
132	110	99	170	155	225	204	
133			1621	969	2093	1640	
134			251	126	295	220	
135			280	614	477	499	
136				69	47	58	
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			243	134	267	202	
148							
149			41		69	52	
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164					50		
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

DC-33 Silicone Grease
Medium

Chemical Characterization Summary

Mix Ratio: One Component
Cure: None

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 423°K (150°C) - 748°K (475°C)

a_o = 94.6% of initial weight

$$k = 4.69 \times 10^2 \exp\left(\frac{-10,900}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.3×10^4	
373°K (100°C)	3.3×10^3	
423°K (150°C)	5.8×10^2	

Number and Relative Peak Intensity

Temperature, ^{o}K (^{o}C)

DC-33 Silicone Grease
Medium

m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
14	4033	4361	5092	9201	6477	7270	
15	3309	4058	6626	25194	12649	14226	
16	11125	10824	10527	17373	15177	14434	
17	41031	35641	32035	30238	30426	30309	
18	100759	100777	100761	93158	93737	92476	
19	1326	1345	1394	1022	994	945	
20	1000	908	946	1014	1096	1044	
21							
22					57		
23	56						
24			41	93	97	75	
25	182	196	300	488	625	497	
26	1062	1238	1750	3200	4132	2915	
27	2463	2632	3300	7540	16694	6078	
28	46922	46191	46052	52035	54118	51539	
29	2383	2535	3241	8444	19412	5981	
30	1514	1679	1680	1990	2457	2023	
31	4393	4914	5960	7615	9556	10434	
32	11194	10651	10095	9244	9724	9892	
33							
34							
35							
36				64	89	48	
37			52	346	538	151	
38	60	86	110	567	1045	269	
39	338	408	480	2424	10232	1574	
40	8330	8314	8332	9124	11187	9624	
41	347	411	451	1767	24578	1697	
42	366	396	465	1166	9753	1138	
43	723	844	1153	5250	28077	3491	
44	2666	2526	2234	7850	14520	3206	
45	1778	2098	3138	14859	6680	8594	
46	669	690	951	1832	1668	1912	
47			120	1856	586	888	
48				68			
49				240	144	85	
50	51	83	203	1867	1013	674	
51	63	94	278	3209	1694	1245	
52		53	160	1666	858	533	
53				433	2069	257	
54				93	2011	86	
55		58	69	827	11918	762	
56			45	458	9935	396	
57		46	60	1281	16449	805	
58			49	863	1719	449	
59		98	459	7330	1858	2686	
60				719	179	237	
61			246	4211	1058	1561	
62				315	147	109	
63				716	349	278	
64	91	73	98	167		116	
65			134	1261	839	594	
66	125	123	136	656	530	298	
67	44		56	365	2245	265	
68				90	1369	99	
69				279	4939	217	
70				268	5481	186	
71			40	1018	6542	481	
72					685		
73	270	1336	3960	60271	11281	19975	
74		78	367	6315	1256	2105	
75		104	744	10746	3124	4490	
76			51	986	317	409	
77	42	94	269	3135	1364	1389	
78	125	203	615	5083	1939	1636	
79			52	581	711	346	
80					155	54	
81			134	2370	1345	927	
82	44		108	1394	1408	560	
83			47	471	2709	237	
84	223	242	229	379	2360	338	
85				837	3122	345	
86	47		45	298	397	118	
87			150	2823	666	976	
88			62	1509	316	477	
89			237	4309	1015	1522	
90				582	119	163	
91		98	403	6252	2059	2668	
92			51	703	372	369	
93				163	116	55	
94				48	61		
95					297		
96			1369	20977	5220	7344	
97					2028		
98				106	894		
99				103	475		
100					119		
101				384	58	92	
102				796	154	237	
103			337	5461	1339	1914	
104			46	1310	269	390	
105			104	2381	617	772	
106				288	61	63	
107				446	138	149	
108				53			
109				70	54		
110				83	104		
111				212	484	50	
112				222	382	59	
113				153	207		
114							
115			114	2395	593	839	
116				332	46	78	
117				1283	263	413	
118				500	68	118	
119			256	4493	1108	1580	
120				643	134	193	
121				678	165	196	
122							
123				122			
124							
125				501	156	112	
126				218	132	76	
127			92	2577	676	926	

Number and Relative Peak Intensity (Continued)

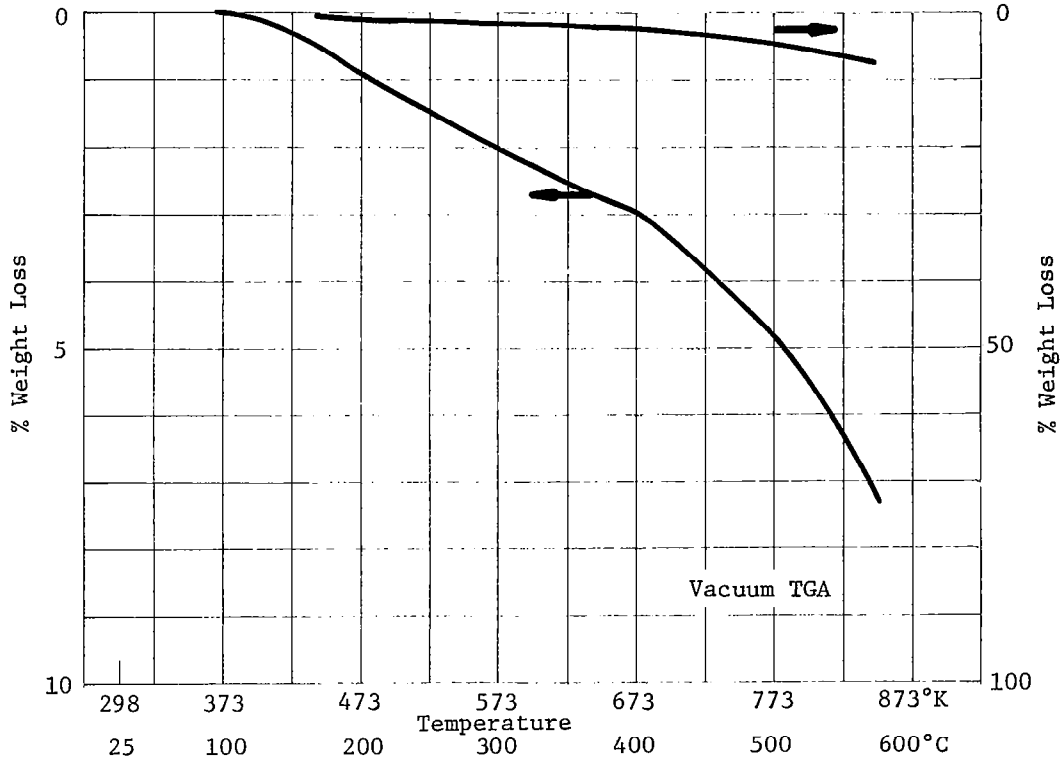
DC-33 Silicone Grease Medium

m/e	Temperature, °K (°C)						
	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
128				306	115	189	
129	270	253	243	423	329	337	
130				41			
131	200	174	192	640	332	371	
132	229	222	219	696	379	412	
133		63	615	9207	2219	3128	
134	58	48	118	1334	317	448	
135			81	3293	1089	1467	
136	41	43	51	405	142	181	
137				186	44	46	
138							
139							
140							
141							
142							
143				68			
144							
145				113			
146				59			
147			71	1763	359	501	
148				240		53	
149			82	516	105	161	
150							
151							
152							
153							
154							
155							
156				41			
157							
158							
159							
160							
161				245			
162				56		110	
163				503	61		
164				115			
165				196		42	
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				266			
178							
179				47			
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191				115			
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208				120			
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: One Component
Cure: None

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

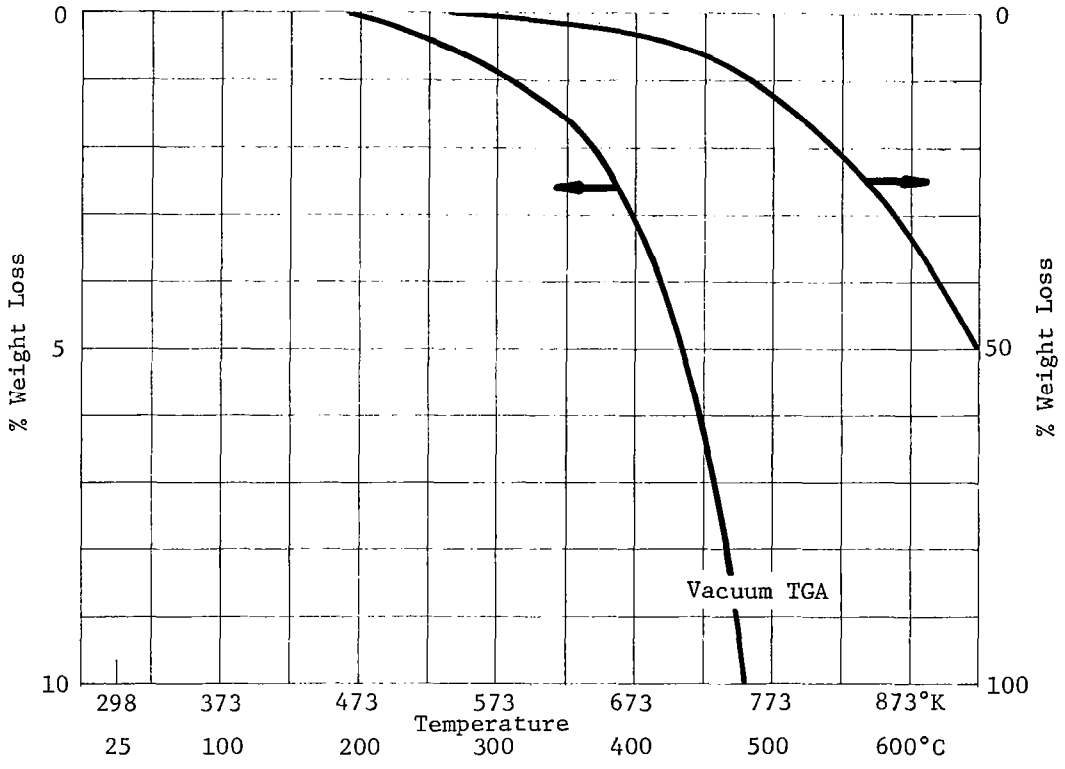
Number and Relative Peak Intensity

m/e	Temperature, °K (°C)			DC-340 Silicone Grease		
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38	DATA NOT AVAILABLE			DATA NOT AVAILABLE		
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						
96						
97						
98						
99						
100						
101						
102						
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						
120						
121						
122						
123						
124						
125						
126						
127						

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $448^{o}K$ ($175^{o}C$) - $1023^{o}K$ ($750^{o}C$)

a_o = 68.2% of initial weight

$$k = 64.7 \exp\left(\frac{-12,200}{1.98\ T°K}\right) \text{min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	1.8×10^{6}	
$373^{o}K$ ($100^{o}C$)	1.4×10^{5}	
$423^{o}K$ ($150^{o}C$)	2.0×10^{4}	

Number and Relative Peak Intensity

	Temperature, °K (°C)					DC-372 Tubing	
m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	645	611	913	1936	3565		
15	68	61	1229	6508	11563		
16	1313	1101	1416	4581	6149		
17	9753	7951	6698	6082	6054		
18	39171	30842	26857	23713	23440		
19	60	290	49	42	126		
20	161	110	147	183	315		
21							
22							
23							
24				95	222		
25			107	819	1446		
26	65	79	1562	5317	8637		
27	183	179	906	3012	5178		
28	21812	19999	23359	30131	36600		
29	202	220	641	2520	4427		
30	116	88	116	266	542		
31	63	71	51	176	393		
32	6298	5554	4912	4388	4762		
33							
34							
35							
36							
37					41		
38				80	122		
39			133	439	829		
40	404	386	432	647	893		
41	59	54	118	366	640		
42			66	205	486		
43	86	74	313	1360	2341		
44	542	534	727	1023	1493		
45			713	5052	10296		
46				85	392		
47				477	1526		
48							
49					47		
50					73		
51					69		
52					51		
53					71		
54							
55				132	182		
56					55		
57				104	243		
58				134	512		
59			400	3280	7508		
60				101	435		
61			195	1878	3545		
62					54		
63					94		
64							
65							
66				57	139		
67					64		
68							
69							
70							
71				122	334		
72				213	542		
73			3467	21939	59270		
74			172	2181	5472		
75			425	3893	7451		
76				74	225		
77				117	467		
78							
79					700		
80					61		
81			101	1064	2637		
82				461	976		
83					84		
84							
85				82	509		
86					44		
87				1062	2340		
88			61	425	1101		
89			168	1764	3403		
90				66	165		
91					83		
92							
93							
94							
95					50		
96					17698		
97			2183	10790	3281		
98			80	66	71		
99							
100							
101							
102				80	263		
103				1825	3234		
104			136	318	496		
105					695		
106							
107							
108							
109							
110					50		
111					56		
112							
113							
114							
115							
116				438	944		
117							
118				141	434		
119				42	96		
120			76	958	1850		
121					56		
122					65		
123							
124							
125							
126				52	143		
127							

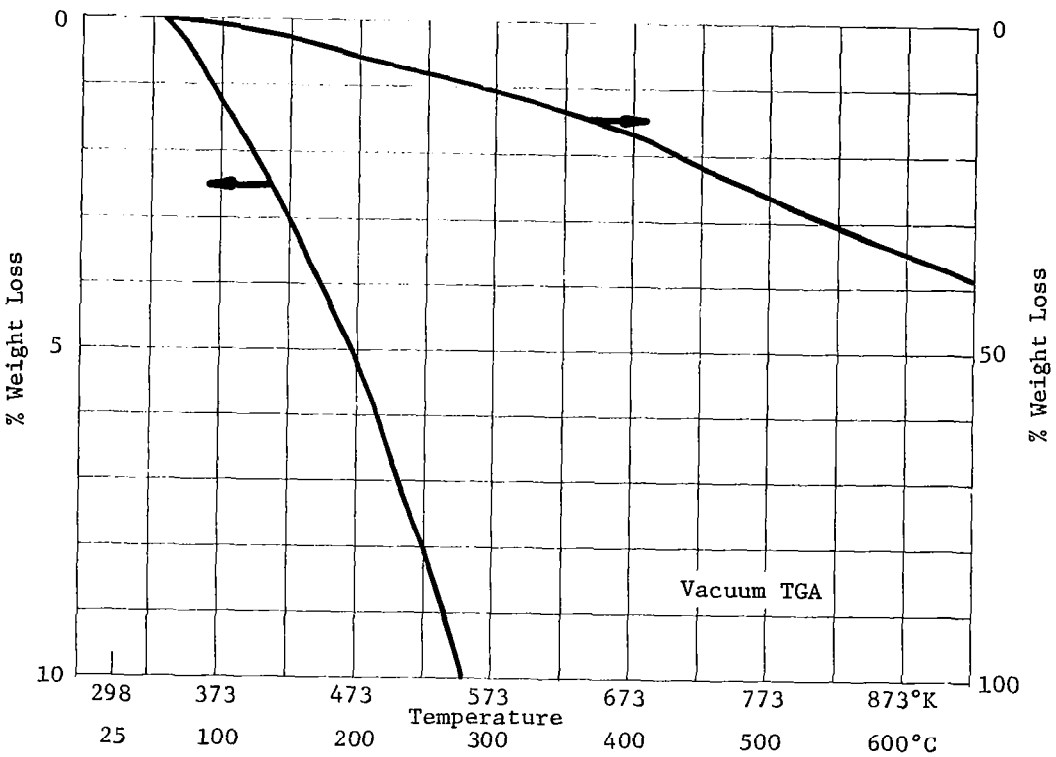
Number and Relative Peak Intensity (Continued)

	Temperature, °K (°C)					DC-372 Tubing	
m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
128							
129							
130							
131							
132					52		
133					69		
134			172	1691	3065		
135				51	194		
136					70		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148					129		
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: One Part
Cure: 15 hrs. at 394°K (121°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 423°K (150°C) - 973°K (700°C)

a_o = 40.1% of initial weight

$$k = 2.0 \exp\left(\frac{-5,700}{1.98\ T°K}\right) \text{min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.4×10^3	
373°K (100°C)	7.2×10^2	
423°K (150°C)	2.9×10^2	

Number and Relative Peak Intensity

Temperature, °K(°C)

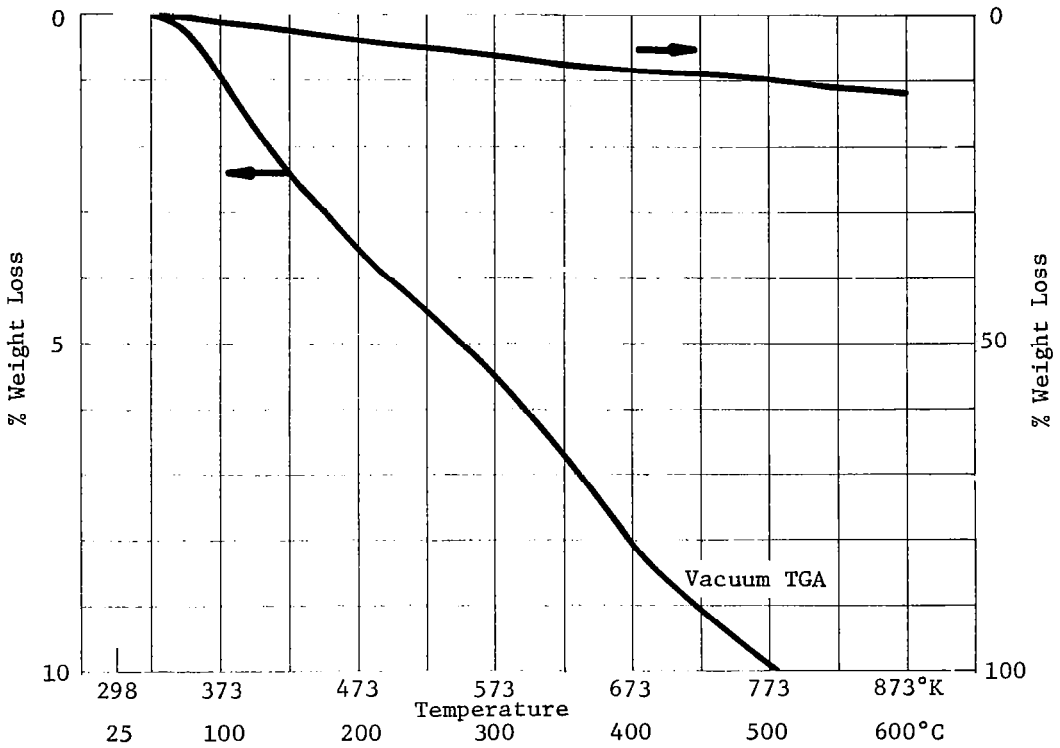
DC-997 Silicone Varnish

m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	1108	1039	2513	1480	1928		
15	206	341	5499	1950	4596		
16	1693	1747	7460	3114	6338		
17	6946	6423	6107	5412	4962		
18	24414	22824	20763	18163	16662		
19							
20			59				
21							
22							
23							
24			114		55		
25							
26	60	422	6812	3082	3123		
27							
28	16420	16759	24785	19266			
29	360	819	2741	1586			
30	57		244	240			
31							
32	4260	3917	3806	3524			
33							
34							
35							
36					70		
37							
38							
39			10163	4216	4640		
40	555	583					
41		93	2871	1794	99		
42		83		719	62		
43	110			707	87		
44	196		5216	581	497		
45		406	480				
46							
47							
48					42		
49		59					
50		113		3966	6293		
51		129	12213	4245			
52		82		3526			
53				165	85		
54				78			
55			1393	301			
56			814	130			
57			391	46			
58			98				
59							
60			181				
61					82		
62					116		
63			2081	590	971		
64			64		41		
65			102		43		
66			107				
67			612				
68			177				
69			130				
70			84				
71			42				
72							
73							
74			2117		875		
75				108			
76							
77							
78		789	40640	13825	19924		
79				782			
80			46				
81			73				
82			49				
83							
84			56				
85							
86							
87							
88							
89							
90							
91			165	395	107		
92				93	55		
93					45		
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
156					46		
157							
158			132	41			

Chemical Characterization Summary

Mix Ratio: One Part
Cure: 3 hrs. at room temperature with RH greater than 40%

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C) 373°K (100°C) 423°K (150°C)		

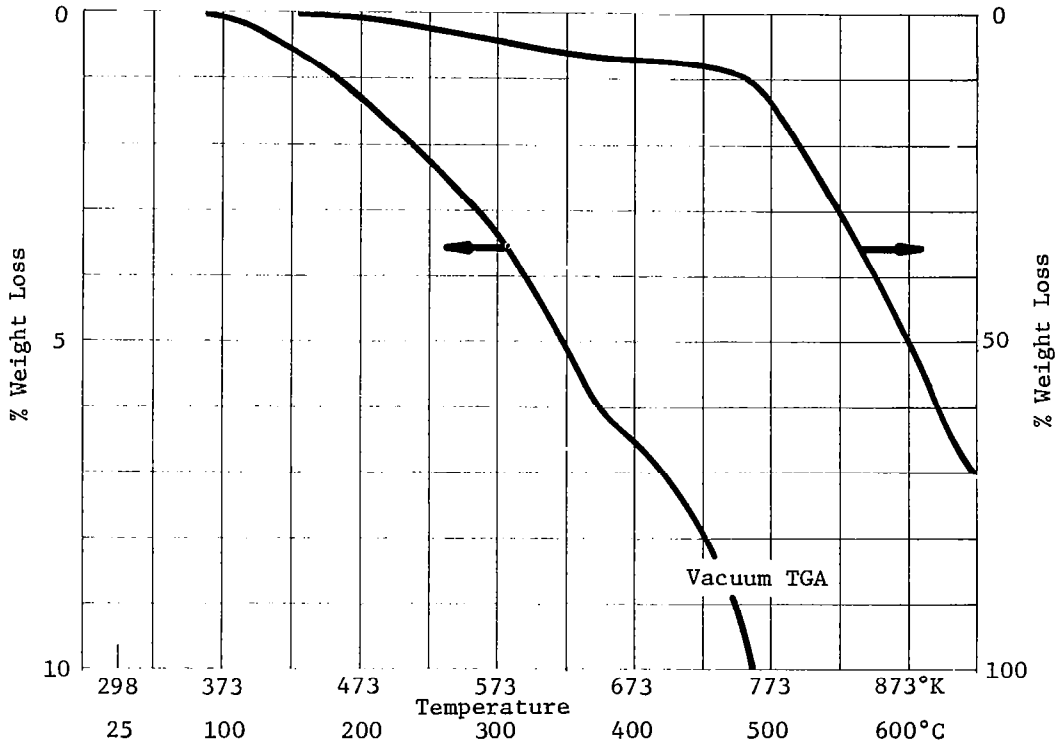
Number and Relative Peak Intensity

	Temperature, °K (°C)					DC-1203 Primer	
m/e	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
14	2099	2545	2246	2517	2322		
15	656	1885	1317	2589	2451		
16	4398	4283	4282	5541	5761		
17	15962	12843	11904	10932	10492		
18	53555	41103	38115	35588	33549		
19	720	791	716	739	737		
20	475	440	415	466	479		
21							
22							
23							
24							
25		205	118	247	61		
26	462	1211	1022	1557	652		
27	589	1655	1338	2149	687		
28	26658	26697	26321	26206	24449		
29	376	3166	1415	1301	422		
30	361	517	509	580	315		
31	124	1656	648	383	117		
32	6163	5499	5455	5234	5109		
33							
34							
35							
36	218	232	190	193	176		
37		59	62	178			
38	54	180	172	391	55		
39	62	726	790	1455	126		
40	2643	2908	2928	3201	2721		
41	67	1315	1236	1831	120		
42	40	694	444	883	48		
43	98	1056	429	551	95		
44	679	1782	1100	942	911		
45		378	128	66			
46							
47							
48							
49							
50		67	63	122			
51		54	49	109			
52							
53				73			
54							
55		139	122	132			
56		521	325	153			
57							
58							
59							
60							
61							
62							
63							
64							
65							
66				43			
67				57			
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78				59			
79							
80							
81							
82							
83							
84	47	68	49				
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
128							
129	65	76	42	42			
130							
131	44						
132	66	60	54	55			

Chemical Characterization Summary

Mix Ratio: 10 pbw Resin to 1 pbw Accelerator
Cure: 16 hrs. at room temperature, 2 hrs. at 333°K (60°C),
8 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 723°K (350°C) - 973°K (700°C)

a_o = 69.0% of initial weight

$$k = 1.42 \times 10^{8} \exp\left(\frac{-34,300}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	8.5×10^{14}	
373°K (100°C)	6.3×10^{11}	
423°K (150°C)	2.6×10^{9}	

Number and Relative Peak Intensity

Temperature, °K (°C) — DC-3116 Encapsulant

m/e	298 (25)	523 (250)	723 (450)	873 (600)	973 (700)		
14	1171	933	1887	4113	1645		
15	249	259	3774	18858	2583		
16	2443	2150	2673	5842	2628		
17	10635	8072	5319	5504	4977		
18	35858	26332	17302	16634	15884		
19	2175	2195	1933	1144	1304		
20	186	182	187	240	171		
21							
22							
23							
24				313			
25			210	1280	152		
26	108	161	1230	6507	948		
27	298	364	1348	7085	897		
28	16018	14237	16548	31664	16468		
29	312	318	1413	8448	743		
30	510	449	506	1046	469		
31	49	235	166	698	144		
32	3018	2641	2334	2502	2458		
33							
34							
35							
36							
37				91			
38			43	167			
39	51	66	365	777	150		
40	1694	1539	1733	2927	2025		
41		74	374	502	110		
42		60	216	528	89		
43	47	74	405	3055	201		
44	562	488	439	1495	577		
45			1152	13273	543		
46			42	760			
47			106	1776	53		
48							
49				48			
50				71			
51				132			
52				116			
53				109			
54							
55			67	310			
56			45	69			
57				568			
58			62	952			
59			853	9919	343		
60			44	850			
61			533	5097	112		
62				229			
63				212			
64							
65							
66				314			
67				104			
68							
69				65			
70				69			
71			42	887			
72			63				
73			6133	89011	4664		
74			591	8816	343		
75			1147	12206	490		
76				797			
77			65	585			
78				80			
79				153	79		
80							
81			378	3234	89		
82			193	1928	49		
83				351			
84				52			
85			62	951			
86				315			
87			482	4586	102		
88			190	2674	57		
89			767	6762	178		
90			75	726			
91			40	494			
92							
93							
94				67			
95							
96			5596	44658	1496		
97							
98			49	202			
99				107			
100							
101				417			
102			141	1537			
103			1110	9550	298		
104			211	2238			
105			271	2701	61		
106				295			
107				295			
108				64			
109				45			
110				170			
111				359			
112				135			
113				135			
114				42			
115			571	5025	108		
116			48	856			
117			254	2992	76		
118			84	1153			
119			1016	9416	268		
120			53	1132			
121			65	1082			
122				50			
123							
124							
125			109	1201			
126				319			
127				43			

Number and Relative Peak Intensity (Continued)

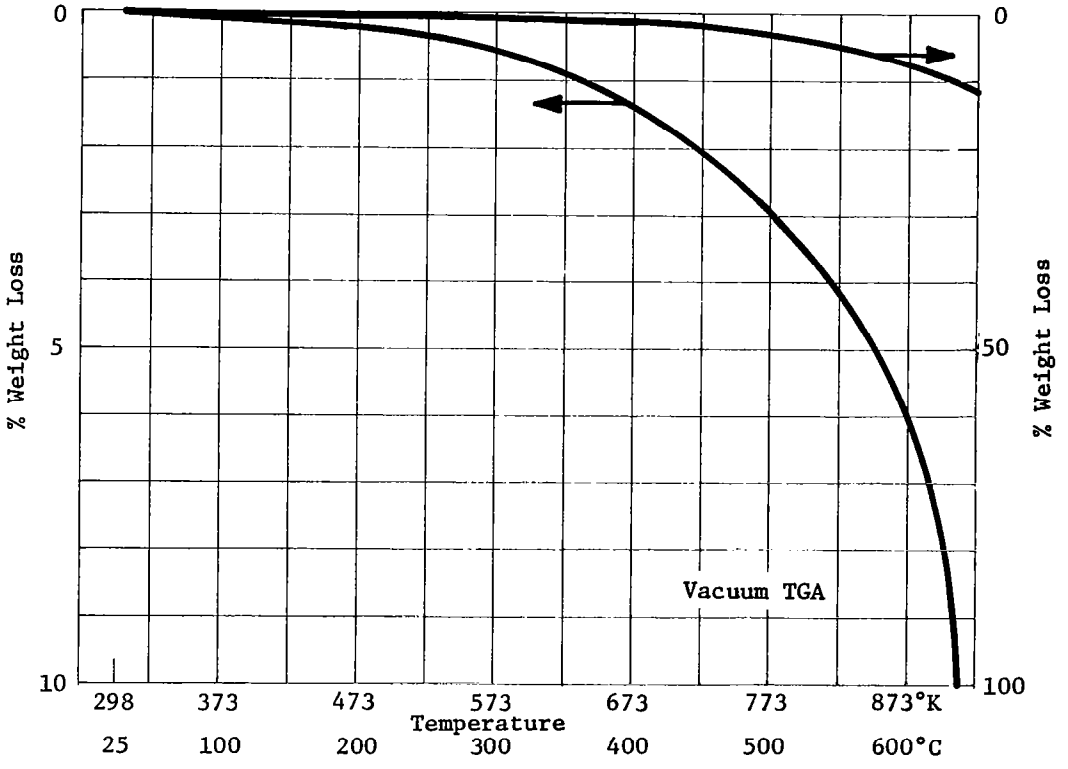
DC-3116 Encapsulant

m/e	Temperature, °K (°C) 298 (25)	523 (250)	723 (450)	873 (600)	973 (700)		
128							
129				182			
130				45			
131			63	1137	41		
132			151	1502			
133			3130	25734	795		
134			400	3516	78		
135			246	2287	47		
136				170			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			604		370		
148			61				
149			135		42		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			147				
162							
163			346		85		
164							
165			119				
166			163				
167			78				
168							
169							
170			49				
171							
172							
173							
174							
175			213				
176			59	847			
177			552	4863	146		
178			54	1037			
179			86	1204			
180				132			
181				50			
182							
183							
184							
185							
186							
187							
188							
189				443			
190				153			
191			1166	8694	336		
192			171	1740			
193			582	4460	150		
194			59	809			
195				356			
196							
197							
198							
199							
200							
201							
202							
203				126			
204				51			
205				247			
206				121			
207			7762	50990	2227		
208			1483	10263	363		
209			782	5904	169		
210			52	679			
211				168			
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223				271			
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 823°K (550°C)

a_o = 22% of initial weight

$$k = 5.0 \exp\left(\frac{-9310}{1.98\ T°K}\right) \text{min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.6×10^5	
373°K (100°C)	3.6×10^4	
423°K (150°C)	8.0×10^3	

Number and Relative Peak Intensity

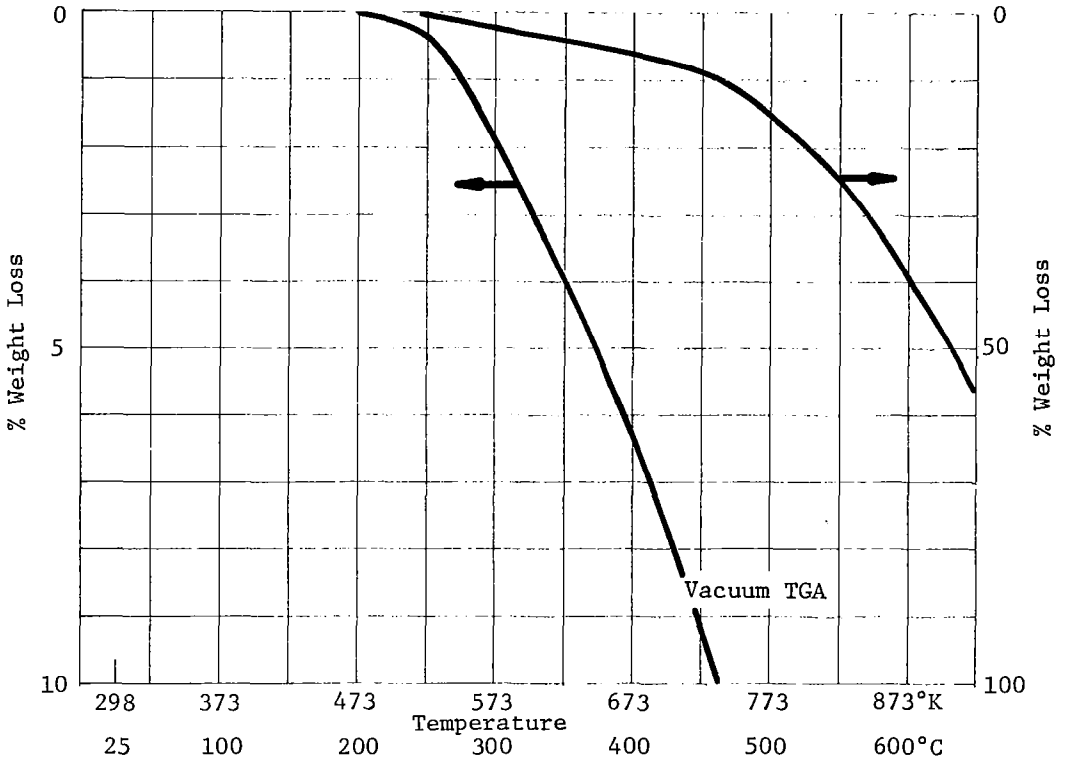
Temperature, ^{o}K (^{o}C) — DC6-1102 Sealant

m/e	298 (25)	573 (300)	873 (600)	923 (650)	973 (700)	1023 (750)	
14	2571	2602	5767	9012	7925	6284	
15	1082	1449	13178	25594	23008	12458	
16	7391	7767	15889	27034	27659	18662	
17	16069	23544	20862	20361	20713	20723	
18	85580	75723	64983	62276	62681	64076	
19	722	730	987	1102	1056	1256	
20	639	627	655	643	646	449	
21							
22							
23							
24				164	704		
25			656	1313		221	
26	365	564	4457	7334	4677	2571	
27	684	757	3500	6000	3801	2298	
28	35364	35373	43521	49759	43863	42829	
29	393	477	1485	2308	1964	951	
30	704	680	865	994	945	830	
31				291	451		
32	8528	7997	6914	6940	6888	7273	
33							
34							
35							
36							
37							
38				116			
39		43	571	1291	686	498	
40	5880	5887	6668	7263	7222	6984	
41		56	555	1209	752	569	
42			270	796	696	111	
43		81	351	1230	2217	209	
44	1332	1297	1466	1710	2138	2771	
45			886	2218	2843		
46							
47				70	47		
48							
49							
50							
51							
52							
53					129		
54							
55				64	245		
56							
57					53		
58				263	260		
59			467	2113	1878		
60							
61			231	543	48		
62							
63							
64				187	590	845	
65							
66			50	231	523	412	
67							
68					64	57	
69							
70							
71							
72							
73			3305	7764	11580	416	
74			104	568	719		
75			691	1328	1035		
76							
77							
78							
79							
80							
81			71	192			
82				54			
83							
84	46						
85							
86							
87			70	243			
88				40			
89			236	526			
90							
91							
92							
93							
94							
95							
96			3065	3942	706		
97			92	603			
98							
99							
100							
101							
102							
103			258	573			
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115				74			
116							
117							
118							
119							
120			140	312			
121							
122							
134			573	981	66		

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $473^{o}K$ ($200^{o}C$) - $1023^{o}K$ ($750^{o}C$)

a_o = 89.2% of initial weight

$$k = 6.56 \exp\left(\frac{-9,020}{1.98\ T°K}\right) min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	1.2×10^5	
$373^{o}K$ ($100^{o}C$)	1.9×10^4	
$423^{o}K$ ($150^{o}C$)	4.4×10^3	

Number and Relative Peak Intensity

Temperature, °K (°C)

DC6-1103 Lubricant

m/e	298 (25)	473 (200)	623 (350)	723 (450)	823 (550)	923 (650)	
14	1075	1081	1082	1353	2115	3297	
15	538	548	678	1605	4310	9026	
16	3740	3461	3388	3775	4658	6469	
17	11401	9711	8873	8594	8360	8347	
18	34018	27977	25273	24194	22869	22259	
19	104	101	99	116	130	135	
20	312	303	280	305	326	342	
21							
22							
23							
24				66	145	285	
25	65	58	79	204	440	876	
26	280	281	406	873	2032	3832	
27	453	433	482	730	1397	2760	
28	12390	11767	11944	13517	16177	19990	
29	213	211	276	457	1092	2321	
30	621	637	650	691	766	941	
31			65	78	140	277	
32	2925	2734	2639	2573	2515	2623	
33							
34							
35							
36		41	40	49	62	93	
37					52	94	
38					83	143	
39			97	128	219	449	
40	2315	2325	2330	2401	2583	2897	
41	85	92	96	122	177	353	
42	53	65	68	93	143	262	
43	73	99	114	179	423	887	
44	647	642	635	709	749	1006	
45		44	90	367	1297	2977	
46					93	207	
47				77	226	512	
48						49	
49						52	
50		49	51	61	73	117	
51		44	47	55	79	163	
52					61	112	
53					42	92	
54						56	
55				41	79	156	
56					43	75	
57					78	152	
58				44	117	262	
59			44	221	839	2078	
60				40	105	218	
61			40	164	561	1371	
62					52	113	
63					55	139	
64		42		44			
65		44				71	
66	48	49	44	61	99	186	
67					51	93	
68						43	
69						57	
70						49	
71					106	228	
72				40	135		
73			143	1238	5290	12339	
74				153	590	1418	
75			72	299	1076	2596	
76					96	219	
77			41	61	120	241	
78				50	74	143	
79			44	45	44	99	
80							
81				109	360	843	
82				76	235	531	
83					62		
84	70	72	65	74	83	109	
85					81	192	
86					57	106	
87				110	413	1004	
88				70	240	596	
89				161	590	1499	
90					79	192	
91				50	86	187	
92						57	
93							
94							
95							
96			137	879	3537	8275	
97							
98							
99						40	
100							
101						104	
102					123	295	
103				192	715	1765	
104				52	186	459	
105				81	241	545	
106					43	86	
107					40	74	
108							
109							
110						61	
111					44	77	
112							
113						45	
114							
115				97	350	824	
116					62	143	
117				51	189	438	
118					81	158	
119				154	578	1303	
120					79	182	
121					75	161	
122							
123							
124							
125					91	163	
126						42	
127							

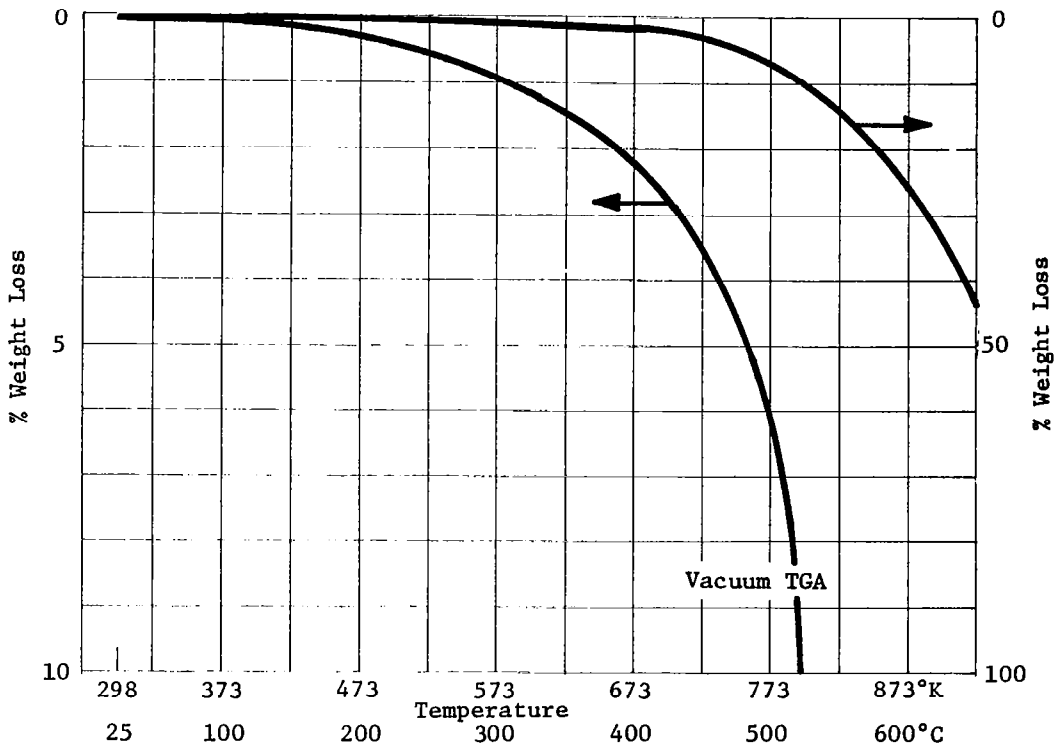
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 298 (25)	473 (200)	623 (350)	723 (450)	823 (550)	923 (650)	DC6-1103 Lubricant
128							
129	74	84	75	79	89	112	
130							
131	52	55	52	62	111	182	
132	69	66	60	86	124	229	
133			45	320	1213	2791	
134				70	194	409	
135					114	262	
136						46	
137							
138							
139							
140							
141							
142							
143							
144							
145						40	
146							
147				50	182	428	
148						88	
149					57	133	
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161					49	101	
162						42	
163					73	151	
164							
165						68	
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177					48	98	
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191						48	
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208						69	
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: Single component
Cure: 7 days at room temperature at 50% RH

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 453°K (180°C) - 1023°K (750°C)

a_o = 76% of initial weight

$$k = 1.3 \times 10^{4} \exp\left(\frac{-21{,}000}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	8.9×10^{9}	
373°K (100°C)	1.1×10^{8}	
423°K (150°C)	3.6×10^{6}	

Number and Relative Peak Intensity

Temperature, °K (°C) — DC6-1104 Sealant

m/e	298 (25)	523 (250)	673 (400)	873 (600)			
14	2925	2987	3460	13000			
15	1454	1613	3113	36133			
16	9715	9116	9361	19425			
17	30447	5661	22360	19366			
18	99448	79815	69982	56489			
19	386	356	393	365			
20	829	771	775	839			
21							
22							
23							
24			53	762			
25	64	78	314	2667			
26	468	551	1128	11739			
27	965	947	1235	8226			
28	34935	34278	34096	54282			
29	575	690	1014	6880			
30	1181	1249	1335	1559			
31		155	172	717			
32	9310	8437	7716	6297			
33							
34							
35							
36				69			
37				194			
38			49	307			
39		147	200	1126			
40	7236	7094	7019	8260			
41	115	163	211	885			
42	99	134	183	744			
43	117	141	225	2556			
44	1818	1857	1766	2270			
45		40	198	8189			
46				493			
47			62	1487			
48				73			
49				68			
50				146			
51				180			
52				190			
53				159			
54				68			
55				329			
56				129			
57				304			
58				713			
59			53	5522			
60				590			
61			52	3978			
62				245			
63				255			
64	104	213	110				
65		99		121			
66	115	132	117	486			
67			49	176			
68				67			
69				89			
70				68			
71				572			
72				702			
73			162	24991			
74				3102			
75			378	7752			
76				541			
77				486			
78				152			
79				56			
80							
81				2461			
82	42		61	1471			
83				288			
84	215		203	324			
85				471			
86	70	54	43	249			
87				2759			
88				1618			
89			50	4343			
90				489			
91				306			
92							
93							
94							
95							
96			258	24051			
97			42				
98							
99				43			
100							
101				215			
102				808			
103			40	4993			
104				1182			
105				1474			
106				149			
107				168			
108							
109							
110				124			
111				223			
112				82			
113				74			
114							
115				2334			
116				322			
117				1088			
118				430			
119				3726			
120				420			
121				434			
122							
123							
124							
125				508			
126				122			
127							

Number and Relative Peak Intensity (Continued)

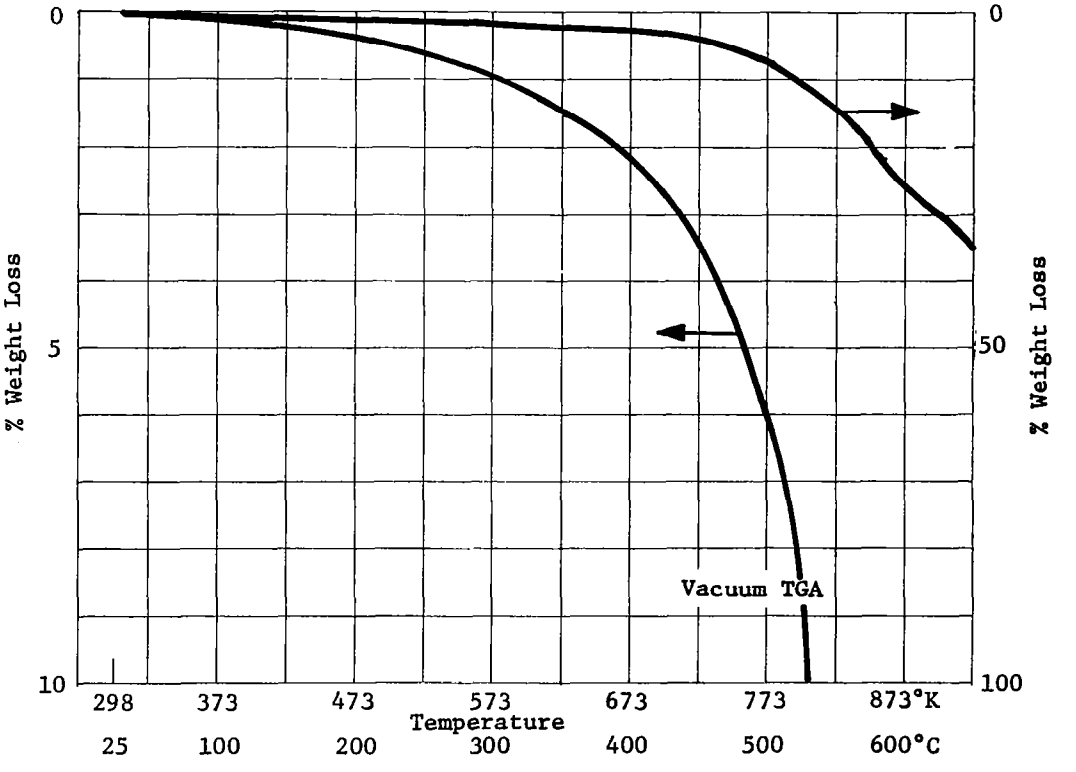
DC6-1104 Sealant

m/e	Temperature, °K (°C) 298 (25)	523 (250)	673 (400)	873 (600)			
128							
129	215	216	196	310			
130				54			
131	154	176	136	449			
132	193	177	190	616			
133			59	7770			
134	53	61	59	1153			
135				623			
136	45	46		107			
137							
138							
139							
140							
141							
142							
143							
144							
145				58			
146				57			
147				1004			
148				145			
149				325			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				171			
162							
163				50			
164				308			
165							
166				106			
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 10 pbw Catalyst
Cure: 7 days at room temperature

1. TGA Preconditioning: 100 hrs. at 398°K (125°C) in N_2 atmosphere



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$$

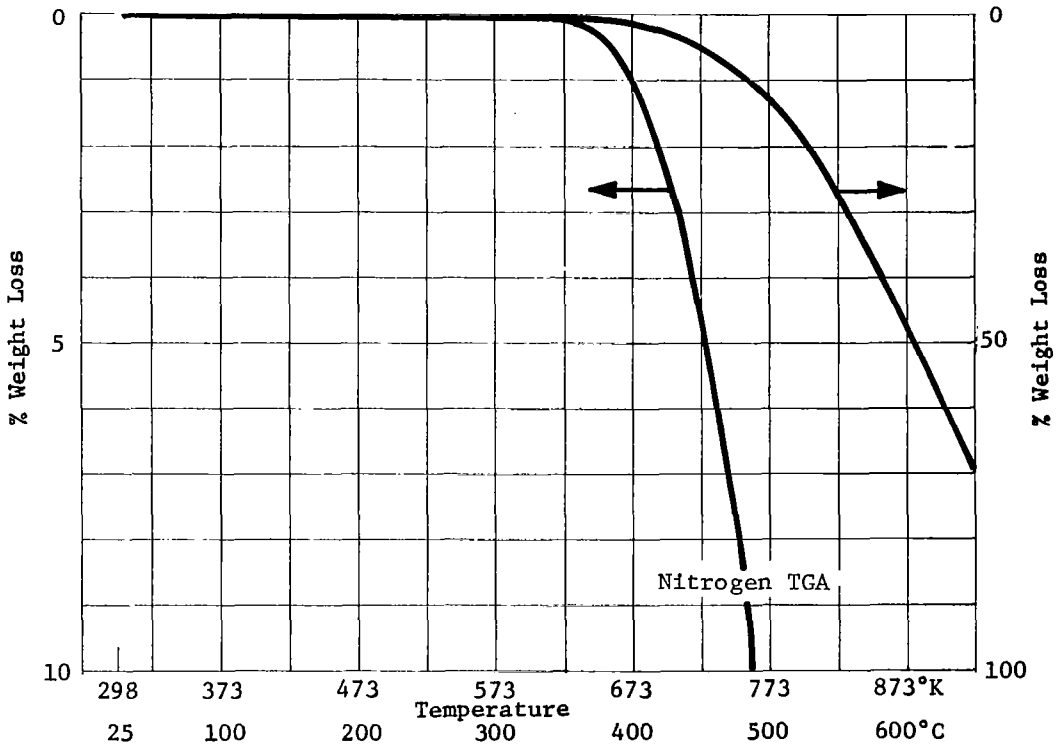
Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 10 pbw Catalyst
Cure: 7 days at room temperature

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1023°K (750°C)

a_o = 79% of initial weight

$$k = 3.8 \times 10^{4} \exp\left(\frac{-21{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		5.5×10^{9}
373°K (100°C)		6.2×10^{7}
423°K (150°C)		1.9×10^{6}

Number and Relative Peak Intensity

Temperature, °K (°C)

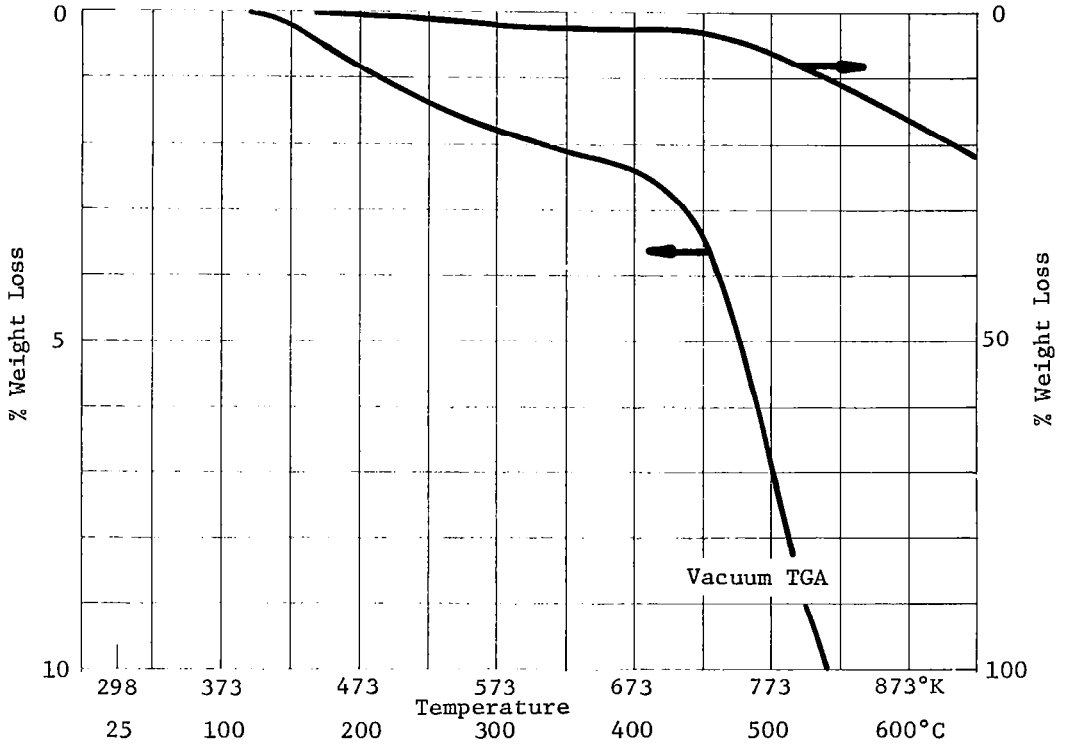
DC6-1106 Sealant

m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	432	396	556	1168	1974		
15	94	104	307	2393	5421		
16	2328	2422	2687	3132	5218		
17	9958	9141	8320	7210	7528		
18	32696	29101	25751	21350	22017		
19					40		
20	42	43	41	45	50		
21							
22							
23							
24					55		
25				116	279		
26	47	62	232	899	1959		
27	100	124	469	576	1118		
28	8613	8487	8979	10315	13342		
29			259	290	546		
30	507	500	622	548	642		
31			241	61			
32	2290	2233	2162	1696	1845		
33							
34							
35							
36							
37							
38							
39			79	54	101		
40	686						
41			134	50	87		
42			41		53		
43			143	69	149		
44	160	215	237	207	283		
45			98	194	607		
46							
47					66		
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59				82	313		
60							
61				61	204		
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73				533	2970		
74				46	157		
75			57	191	431		
76							
77					40		
78							
79							
80							
81					73		
82					50		
83							
84							
85							
86							
87					83		
88							
89				47	134		
90							
91							
92							
93							
94							
95							
96				501	1644		
97					69		
98							
99							
100							
101							
102							
103					82		
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: 10 pbw Resin to 1 pbw Catalyst
Cure: 4 hrs. at room temperature

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 643°K (370°C) – 1123°K (850°C)

a_o = 33.2% of initial weight

$$k = 1.87 \times 10^5 \exp\left(\frac{-27,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	9.7×10^{12}	
373°K (100°C)	3.2×10^{10}	
423°K (150°C)	4.1×10^{8}	

Number and Relative Peak Intensity

DC69-220 Potting Compound

m/e	Temperature, °K (°C) 298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	1013	5335	5802	3910	3301		
15	120	24385	25660	16277	12447		
16	1767	32601	33200	17960	11446		
17	267	6843	5578	5726	5847		
18	46888	25216	21570	22125	21881		
19	88	44	50	56	59		
20	60	45	70	45	43		
21							
22							
23							
24			79	96	178		
25		153	320	640	1028		
26	134	1578	2850	4616	5398		
27	347	1213	2124	3070	4053		
28	25929	24282	28033	30956	32553		
29	528	744	1458	2303	2790		
30	290	331	397	409	481		
31	163	130	128	187	305		
32	7302	5513	4958	4739	4871		
33							
34							
35							
36	49	111	62	57	63		
37		103	54	51	90		
38		252	78	80	152		
39	93	826	546	705	1096		
40	477	715	655	811	979		
41	163	316	430	632	1232		
42	85	113	263	440	679		
43	214	289	487	1083	1391		
44	1107	1305	1110	1157	1536		
45	130	245	1158	2825	3673		
46				73	84		
47			70	282	394		
48							
49		67					
50		772	133	53	60		
51	49	975	158	41	57		
52		766	117	49	59		
53		47			58		
54							
55	49	63	84	159	216		
56	48		40	59	76		
57	42	54	45	76	123		
58			42	125	185		
59		57	799	2129	3217		
60			63	93	120		
61		53	667	1385	1609		
62							
63		108					
64							
65							
66				49	68		
67					46		
68							
69							
70							
71				146	138		
72				106	152		
73	203	484	2910	8477	13180		
74		124	286	947	1274		
75		150	1316	2728	2699		
76		85		60	77		
77		678	146	96	126		
78		3909	632	54			
79		111		44	53		
80							
81			343	884	858		
82			146	368	382		
83				47	42		
84							
85			41	86	141		
86							
87			386	934	1099		
88			199	419	464		
89		64	781	1646	1549		
90				40	70		
91			84	52	75		
92							
93							
94							
95				44	110		
96		657	5743	9898	9744		
97		41	899	1783	1455		
98				48	52		
99							
100							
101							
102			51	95	111		
103		62	782	1522	1562		
104			52	178	189		
105			110	329	276		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			200				
116				357	473		
117							
118			43	106	139		
119					42		
120			353	751	727		
121							
122							
123							
124							
125							
126				104	114		
127							

Number and Relative Peak Intensity (Continued)

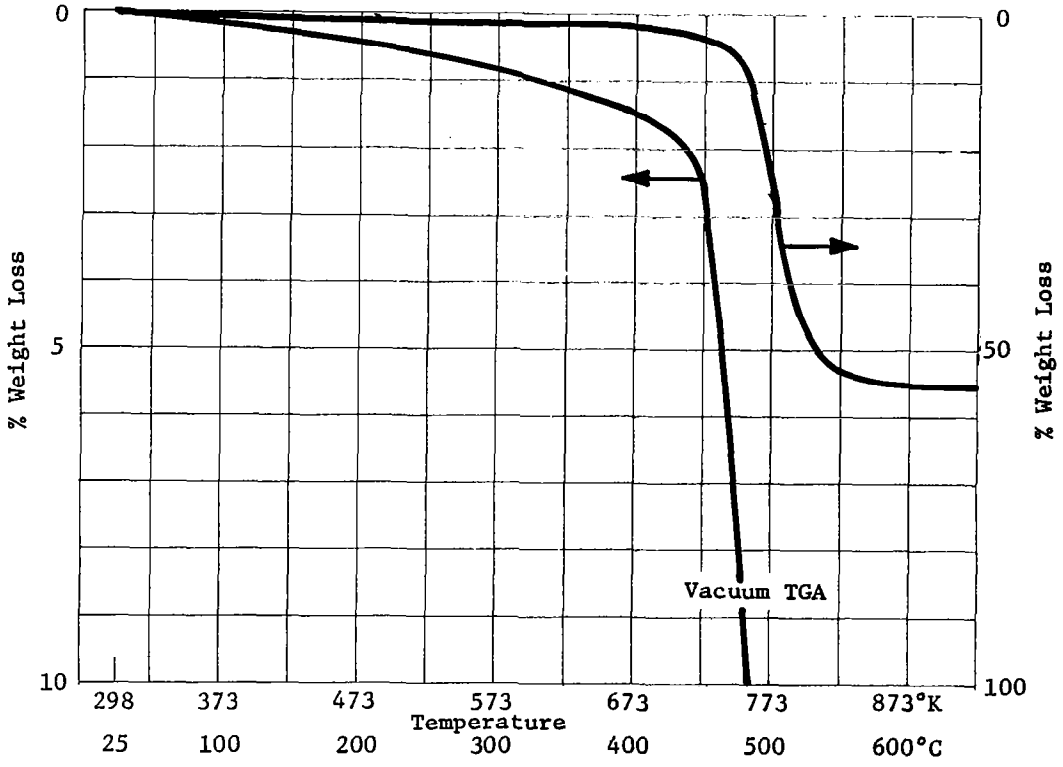
DC69-220 Potting Compound

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129							
130							
131							
132					43		
133							
134			721	1527	1516		
135				62	60		
136				45	40		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148				40	40		
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				41			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: Single component
Cure: 48 hrs. at room temperature plus 48 hrs. at 397°K (124°C)

1. TGA Preconditioning: 100 hrs. at 398°K (125°C) in N_2 atmosphere



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 923°K (650°C)

a_o = 54% of initial weight

$$k = 5.2 \times 10^6 \exp\left(\frac{-26{,}700}{1.98\ T°K}\right)\ min^{-1}$$

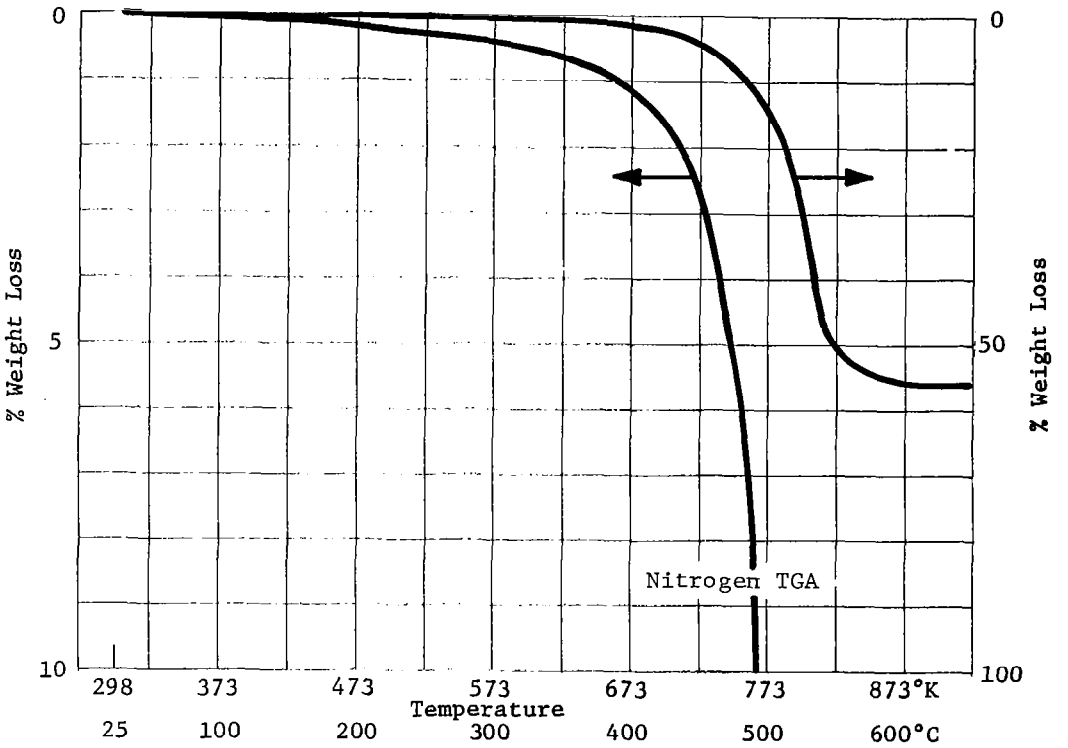
Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.6×10^{11}	
373°K (100°C)	6.0×10^8	
423°K (150°C)	8.0×10^6	

Chemical Characterization Summary

Mix Ratio: Single component
Cure: 48 hrs. at room temperature plus 48 hrs. at 397°K (124°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 923°K (650°C)

a_o = 55% of initial weight

$$k = 3 \times 10^{11} \exp\left(\frac{-43{,}700}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		1.0×10^{15}
373°K (100°C)		1.0×10^{12}
423°K (150°C)		8.8×10^{10}

Number and Relative Peak Intensity

Temperature, °K (°C) — DC92-007 Coating

m/e	298 (25)	523 (250)	723 (450)	773 (500)	823 (550)	923 (650)	
14	915	1059	3332	7485	2682	1473	
15	476	615	14362	37284	6347	2460	
16	5441	5263	10524	16726	8468	6872	
17	28338	24586	22344	24342	21257	20831	
18	95778	81511	72758	77961	67487	67151	
19	52	59	78	68	74	100	
20	265	273	310	421	306	277	
21							
22							
23							
24			225	416	93	46	
25	64	90	1255	2235	443	105	
26	611	632	6728	11633	2881	1000	
27	1043	908	5099	11389	2272	975	
28	15877	15827	21943	45200	22867	19126	
29	915	691	5398	13619	1483	588	
30	460	475	933	1564	714	497	
31		48	226	742	104	63	
32	3573	3434	3480	3917	3199	3328	
33							
34							
35							
36				54			
37	46	45	78	115	64		
38	51	69	132	210	69	50	
39	892	606	858	1323	606	379	
40	4016	4130	5150	7041	4769	4696	
41	1817	1284	1307	1460	967	582	
42	251	181	341	804	239	150	
43	934	706	2041	4467	651	371	
44	462	554	1152	2006	783	1035	
45		44	4873	14197	792	135	
46			175	543	45		
47			760	2629	116		
48			58	80			
49			55	79			
50	84	89	109	136	63	78	
51	123	115	170	233	91	86	
52	63	63	100	219	52	62	
53	168	158	158	217	97	61	
54	122	112	71	74	63	56	
55	986	604	543	801	328	207	
56	326	239	204	201	131	133	
57	308	197	276	554	154	97	
58	42	55	296	934	72	44	
59			3135	9248	369	79	
60			212	776	51		
61			3435	9156	357		
62			121	325	40		
63	43	42	150	321	52		
64	40	55	53	87	50	43	
65	94	90	130		86	59	
66	82	85	194	456	106	64	
67	319	183	188	274	137	113	
68	122	90	91	87	71	43	
69	296	207	132	167	100	103	
70	162	73	109	121	77	54	
71	80	78	273	769	77	46	
72			216	791	44		
73		45	6754	20746	1467	392	
74			1087	3655	127	54	
75			5132	13409	570	64	
76			215	607	53		
77	85	70	271	674	98	67	
78	51	52	81	112	76	41	
79	119	97	106	104	59	64	
80	51	44	79	152			
81	158	133	1661	4454	191	75	
82	89	68	990	2828	119	44	
83	108	83	144	284	63	45	
84	80	79	90	115	68	79	
85			159	408	48		
86			74	139	47		
87			1872	4891	172		
88			909	2678	90		
89			3015	7677	190		
90			200	582	45		
91	85	68	147	314	66	50	
92			60	52	41		
93	49	40	40				
94			48	47			
95	88	66					
96		40	18763	44519	2044	90	
97	45	41	1994	4930	133		
98			44				
99			44	56			
100							
101			66	159			
102			257	752			
103			2488	6458	138		
104			395	1214	53		
105			443	1470	48		
106			53	120			
107			58	100			
108							
109							
110				41			
111			42	73			
112							
113				48			
114							
115			608	1792	42		
116			73	154			
117			162	485			
118			71	155			
119			860	2590	49		
120			94	183			
121			55	106			
122							
123							
124							
125				70			
126							
127							

Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					DC92-007 Coating	
	298 (25)	523 (250)	723 (450)	773 (500)	823 (550)	923 (650)	
128							
129							
130							
131							
132			54	45			
133			361	988			
134			55	87			
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Table 1 Emissivity (V71/96P)

Exposure	Average	High	Low	Samples Tested
Baseline*	0.86	0.86	0.86	5
Heat Compatibility (1)	0.86	0.86	0.86	5
Heat Compatibility Plus 30 day Thermal Vacuum (1) (2)	0.84	0.84	0.84	5

Table 2 Absorptivity (V71/97P)

Baseline*	0.20	0.21	0.20	5
Heat Compatibility (1)	0.20	0.20	0.19	5
Heat Compatibility Plus 30 day Thermal Vacuum (1) (2)	0.22	0.22	0.22	5

*Cured 48 hours at room temperature plus 48 hours at 397°K (124°C)

(1) Heat compatibility - 570 hours at 408°K (135°C) in N_2 atmosphere

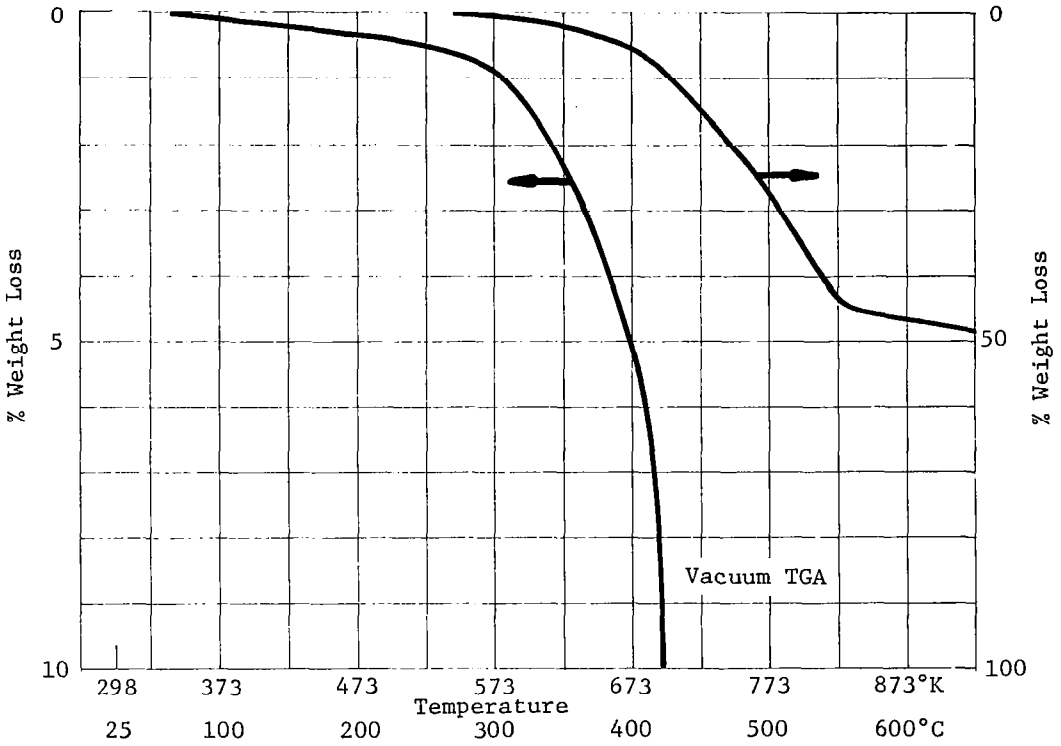
(2) Thermal vacuum - tested in air after the specified exposure time at 338°K (65°C) and 1 x 10^{-6} Torr

DC92-007 Gloss
Gray Coating

Chemical Characterization Summary

Mix Ratio: 95 pbw 92-007 Resin to 5 pbw V1747 Black Pigment
Cure: 24 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 873°K (600°C)

a_o = 47.3% of initial weight

$$k = 8.64 \times 10^4 \exp\left(\frac{-20,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.8×10^8	
373°K (100°C)	5.4×10^6	
423°K (150°C)	2.1×10^5	

Condensible degassing
= 1.1×10^{-4}%/day

Isothermal weight loss
in nitrogen = 0.18%

Number and Relative Peak Intensity

DC92-007 Gloss Gray Coating

m/e	Temperature, °K (°C) 298 (25)	573 (300)	723 (450)	873 (600)	1023 (750)		
14	2372	2857	3272	4134	3678		
15	167	297	4323	2815	1825		
16	1979	2163	3243	4154	3478		
17	7084	6207	4701	6350	5852		
18	25668	21053	14655	22915	17539		
19	127	127	102	173	289		
20	186	183	166	264	210		
21							
22							
23							
24			155	108	41		
25		59	580	382	152		
26	104	323	2532	1649	789		
27			2131	1571			
28	37902	40554	42066	58254	51624		
29	365	557	2172	1208	738		
30	375	488	514	655	532		
31			204	203			
32	7687	7969	6784	10175	8844		
33							
34				50	61		
35							
36				40			
37			55	49			
38			90	84	50		
39	50	142	329	363	233		
40	2038	2285	2257	3308	3002		
41	41	192	355	337	241		
42		72	226	192	121		
43	55	138	634	407	253		
44	568	626	659	812	1036		
45			1611	648	244		
46			92				
47			354	121			
48							
49							
50			63	60	71		
51			68	68	66		
52			53	52			
53			60	50	41		
54							
55		63	122	93	91		
56		40	59	52	53		
57			103	81	60		
58			160	70			
59			1105	403	87		
60			148	62			
61			1037	263			
62			57				
63			63				
64				49	54		
65							
66			70	68	51		
67			51				
68							
69							
70							
71			145	40			
72			153	51			
73			2035	1592	654		
74			506	198	75		
75			1627	474	105		
76			112				
77			110	70	51		
78				49	51		
79							
80			43				
81			573	137			
82			342	74			
83			55				
84							
85			73				
86			50				
87			618	149			
88			372	107			
89			1000	255			
90			101				
91			73	41			
92							
93							
94							
95							
96		42	5850	1500	201		
97			103	313			
98							
99							
100							
101			64				
102			195	48			
103			1145	248	40		
104			240	61			
105			325	64			
106			41				
107							
108							
109							
110							
111							
112							
113							
114							
115							
116			547	109			
117			77				
118			267	51			
119			87				
120			899	174			
121			106				
122			102				
123							
124							
125							
126			40				
127							

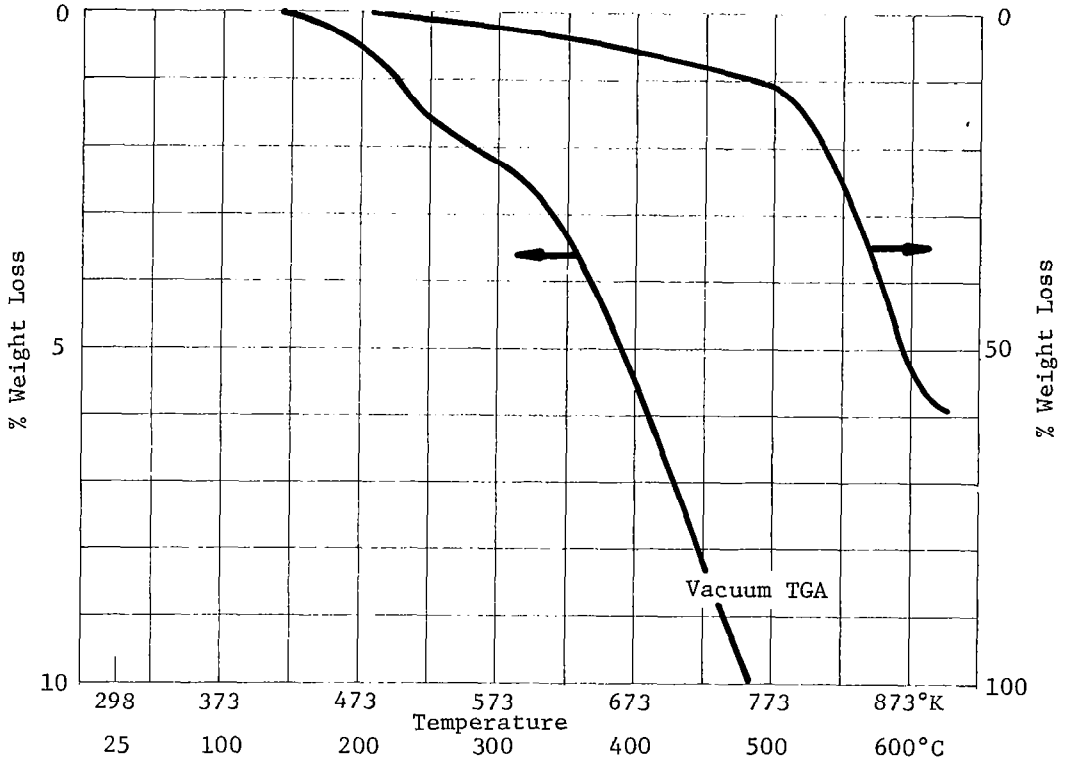
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					DC92-007 Gloss Gray Coating	
	298 (25)	573 (300)	723 (450)	873 (600)	1023 (750)		
128							
129							
130							
131			100				
132			190				
133			1516	405	67		
134			335	68			
135			230				
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146			43				
147			486	96			
148'			80				
149			156				
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			207				
162			57				
163			339	48			
164							
165			50				
166			120				
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			100				
178			376	43			
179			72				
180			51				
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192			402				
193			71				
194			143				
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207				56			
208			1441	128			
209			308				
210			145				
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 80 pbw 92-009 Resin, 20 pbw V1747 Black Pigment
Cure: 24 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 873°K (600°C)

a_o = 56.8% of initial weight

$$k = 7.98 \times 10^3 \exp\left(\frac{-19,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	8.0×10^8	
373°K (100°C)	1.4×10^7	
423°K (150°C)	6.7×10^5	

Number and Relative Peak Intensity

Temperature, °K (°C) — DC92-009 Black Coating

m/e	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
14	2118	4298	15094	28828	3763		
15	340	7337	60195	101107	19259		
16	2906	10676	40834	67800	9488		
17	9081	18528	15417	14785	1282		
18	29052	60795	48583	43002	3212		
19	54	105	127	173			
20	111	247	394	519			
21							
22		106	81	72			
23							
24		303	1168	2025	72		
25		1244	4067	6865	530		
26	234	5935	18927	33668	3171		
27		5287	15572	40029	4163		
28	21122	38100	68930	101081	12239		
29	245	4691	14025	35799	4062		
30	446	1851	2752	4415	374		
31		937	1215	3239	280		
32	4752	4406	4947	5157	415		
33				74			
34				49			
35							
36		64	148	259			
37		239	743	1118			
38		384	1116				
39	49	1686	4291	6593	308		
40	881	1761	3408	5092	459		
41	46	2069	3823	4656	208		
42		1405	2427		293		
43	64		5166	11738	1444		
44	340	15605	13570	12759	1276		
45		3385	12553	37928	4183		
46		227	773	2286	113		
47		1467	3054	7453	668		
48		56	129	296			
49		101	230	477			
50		429	1207	1502			
51		314	1277	2232			
52		217	913	1511			
53		301	572	1164	41		
54		156	219	534			
55		1051	1147	1564	66		
56		545	522	498			
57		477	748	1551	66		
58		183	1040	3111			
59		489	6547	21452	2341		
60		164	802	2415	121		
61		456	6093	17322	1569		
62		53	424	1191			
63		58	548	1383	100		
64		57	119				
65		109	594		77		
66		124	786	1790	110		
67		231	496	747			
68		91	118	178			
69		173	257	375			
70		88	143	252			
71		105	781	2168	92		
72		49	868		106		
73		732	16500	71030	7577		
74			3009	10154	846		
75		5982	13059	29401	2422		
76		366	1024	2276	74		
77		375	1377	2669	50		
78		189	1619	2087			
79		75	264	339			
80							
81		181	3235	9002	633		
82		100	1915	5315	277		
83		80	358				
84		161	207	340			
85		65	469	1396	40		
86			230	701			
87		90	3356	9594	652		
88		47	2007	5704	318		
89		173	5324	15050	1024		
90			587	1702			
91		95	1243	2795			
92			179	516			
93		40	74	313	251		
94		43	53	86			
95		49			60		
96		1098	27297	76758	5544		
97				8985	1077		
98							
99			48	152			
100				47			
101			179	657			
102			869	2286	56		
103		174	5508	13815	823		
104			1261	3001	94		
105		53	1708	4100	128		
106			128	423			
107			177	429			
108				48			
109							
110			42	139			
111			91	279			
112				103			
113			47	138			
114							
115		70	2280	5005			
116			258	677	146		
117			973	2204			
118			244	289			
119		88	3585	7486	64		
120			378	812	282		
121			349	375			
122				715			
123							
124							
125			116	392			
126			48	99			
127			90	86			

Number and Relative Peak Intensity (Continued)

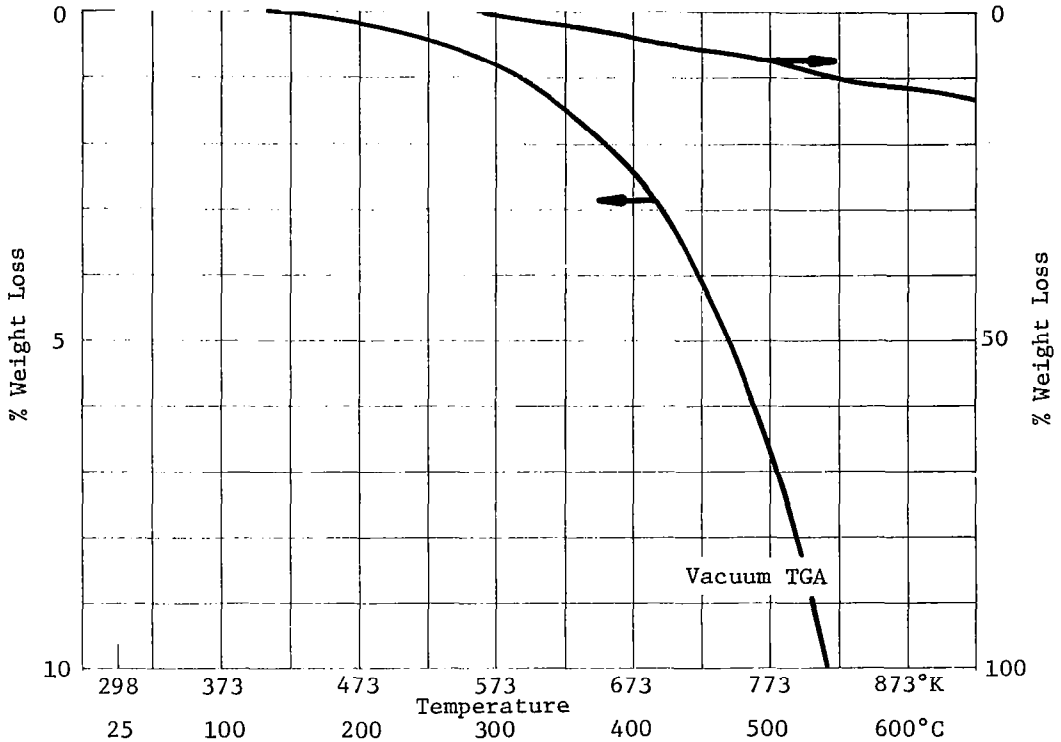
DC92-009 Black Coating

m/e	Temperature, °K (°C)						
	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
128				152			
129			107	149			
130							
131			187	393			
132			289	506			
133		149	4998	9732	361		
134			575	1248	216		
135			319	825			
136				56			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146				92			
147			358	1451			
148'				163			
149			70				
150				336			
151							
152							
153							
154			104				
155							
156							
157			82				
158							
159							
160							
161							
162				59			
163							
164							
165							
166							
167							
168				47			
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 10 pbw Catalyst
Cure: 4 hrs. at 339°K (66°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) – 923°K (650°C)

a_o = 9.3% of initial weight

$$k = 4.83 \times 10^{18} \exp\left(\frac{-64{,}600}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	9.7×10^{24}	
373°K (100°C)	1.2×10^{19}	
423°K (150°C)	4.0×10^{14}	

Number and Relative Peak Intensity

Temperature, °K (°C)

DC93-072 A/B

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	1183	5898	8842	5789	4654		
15	439	23072	37055	22236	15990		
16	2358	29922	45938	27651	19117		
17	8345	6585	6412	6016	5789		
18	27052	19932	18868	17780	16995		
19	194	188	225	231	247		
20	194	191	204	203	196		
21							
22							
23							
24		83	85	95	167		
25	49	234	314	377	601		
26	310	1553	1565	1798	2862		
27							
28	13652	16032	16500	16782	19026		
29	235	476	531	576	1187		
30	201	307	315		490		
31	3206						
32		2807	2724	2712	2749		
33							
34							
35							
36				83			
37		132	133	127	135		
38		180			228		
39		1752					
40	1322		1934	1863	1963		
41	64	293	317	471	874		
42	52	163	201	305	726		
43	82	303	213	302	1179		
44	364	428	427	421	686		
45	44	431	391	435	1625		
46		40		54	103		
47		195	128		142		
48							
49		89	45				
50	54	478	228	85	97		
51	42	538	248	103	120		
52		445	46	66	104		
53		67		62	213		
54				58	71		
55		95	48		224		
56		75			94		
57		68			158		
58					238		
59		106	170	205	1064		
60					89		
61		58	100	90	219		
62							
63		104	51				
64		42	48	43	41		
65	42	58	68	70			
66					176		
67		42					
68							
69							
70							
71					72		
72							
73		454	758	1474	6395		
74		143	125	159	596		
75		1071	653	301	628		
76		152	75		40		
77		405	197	81	92		
78	70	1594	664	190	171		
79		127	60				
80							
81			48	41	129		
82					80		
83		83		69			
84	70		84		81		
85					62		
86							
87			48	50	180		
88				42	146		
89			90	99	228		
90							
91		44	75	75	58		
92							
93							
94							
95							
96		76	527	576	1227		
97							
98							
99							
100							
101							
102							
103			104	120	292		
104					56		
105			55	50	89		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			58	44	131		
116							
117					88		
118							
119			88	76	207		
120							
121							
122							
123							
124							
125							
126							
127							

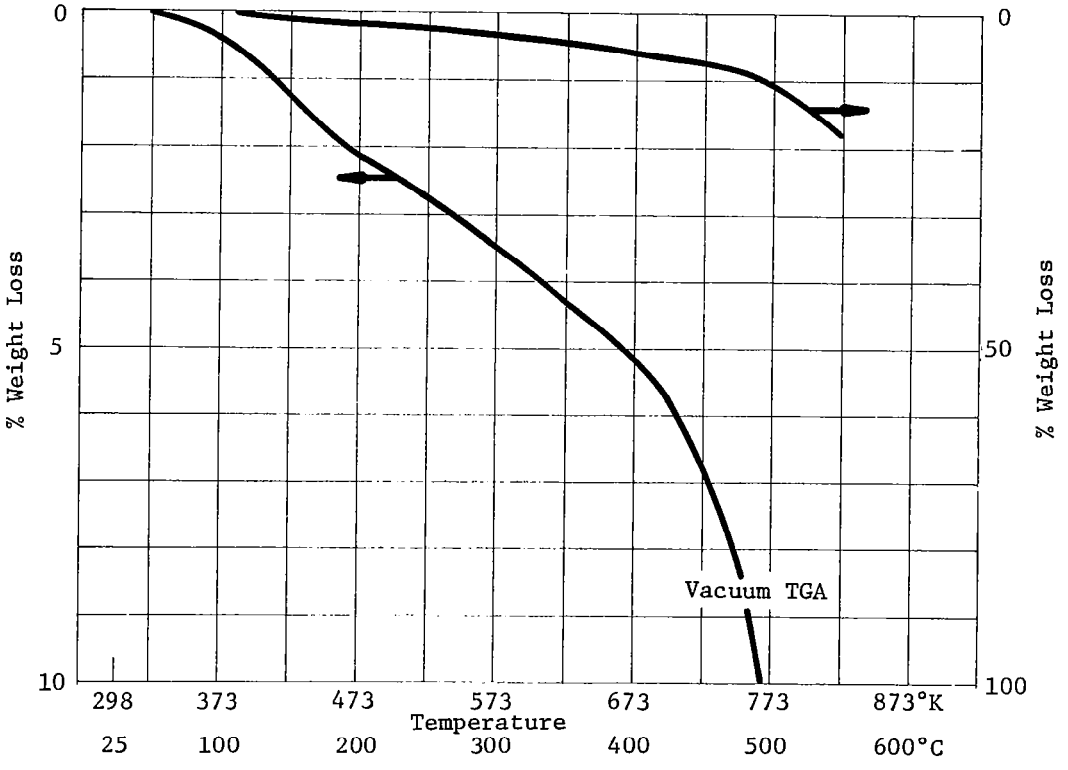
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					DC93-072 A/B	
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	67	85	94	85	94		
130							
131	47	71	67	65	121		
132	55	78	94	71	110		
133			190	200	503		
134			46	45	82		
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147				40	212		
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 1 pbw Resin to 2 pbw Catalyst
Cure: 24 hrs. at 298°K (25°C), 4 hrs. at 333°K (60°C),
4 hrs. at 366°K (93°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C) DC93-076 A/B

m/e	298 (25)	373 (100)	523 (250)	673 (400)	823 (550)		
14	3713	3558	2999	4133	8259		
15	153	285	544	3408	24158		
16	7750	7257	6707	8547	15382		
17	22179	20326	19091	19500	20328		
18	71803	60712	55781	52953	60783		
19	1426	1531	1948	2392	3792		
20	141	177	138	189	274		
21							
22							
23							
24				41	361		
25			44	217	1568		
26	83	255	444	2620	9673		
27	381	708	905	4377	11661		
28	24314	23420	24794	31829	55232		
29	207	372	587	3086	11589		
30	1362	1800	1757	1888	3130		
31		75	407	739	408		
32	5297	5265	5583	5540	7074		
33							
34							
35							
36							
37				161	206		
38				243	258		
39		73	164	2007	1685		
40	2564	2493	2882	3564	5245		
41		131	208	3205	1625		
42		47	98	700	738		
43		57	258	2867	3151		
44	750	785	1056	1579	2550		
45			155	1787	10243		
46			43	79	276		
47				413	1482		
48							
49				56	63		
50				266	486		
51		41	56	251	698		
52				85	388		
53				152	168		
54					51		
55			40	403	291		
56				764	116		
57				153	277		
58				129	543		
59				322	7645		
60				63	445		
61				170	3724		
62					183		
63				45	195		
64							
65					210		
66				43	220		
67				63	101		
68							
69					45		
70				43	46		
71				61	482		
72				58	796		
73				1640	54429		
74				162	5506		
75			142	4319	9456		
76				164	486		
77				303	1382		
78				365	1362		
79				173	635		
80					124		
81				131	2456		
82				50	1172		
83					144		
84							
85				52	367		
86					99		
87				83	2858		
88				42	1672		
89				207	5327		
90					232		
91				127	1787		
92					152		
93							
94					40		
95				45	142		
96				2095	33018		
97				202	6926		
98					263		
99							
100							
101				40	166		
102					954		
103				345	7966		
104				55	1586		
105				123	2077		
106					117		
107					138		
108					57		
109							
110					66		
111					102		
112					52		
113					71		
114							
115				93	3872		
116					405		
117				57	1967		
118					540		
119				270	7195		
120					571		
121				40	523		
122							
123							
124							
125					553		
126					130		
127				57	195		

Number and Relative Peak Intensity (Continued)

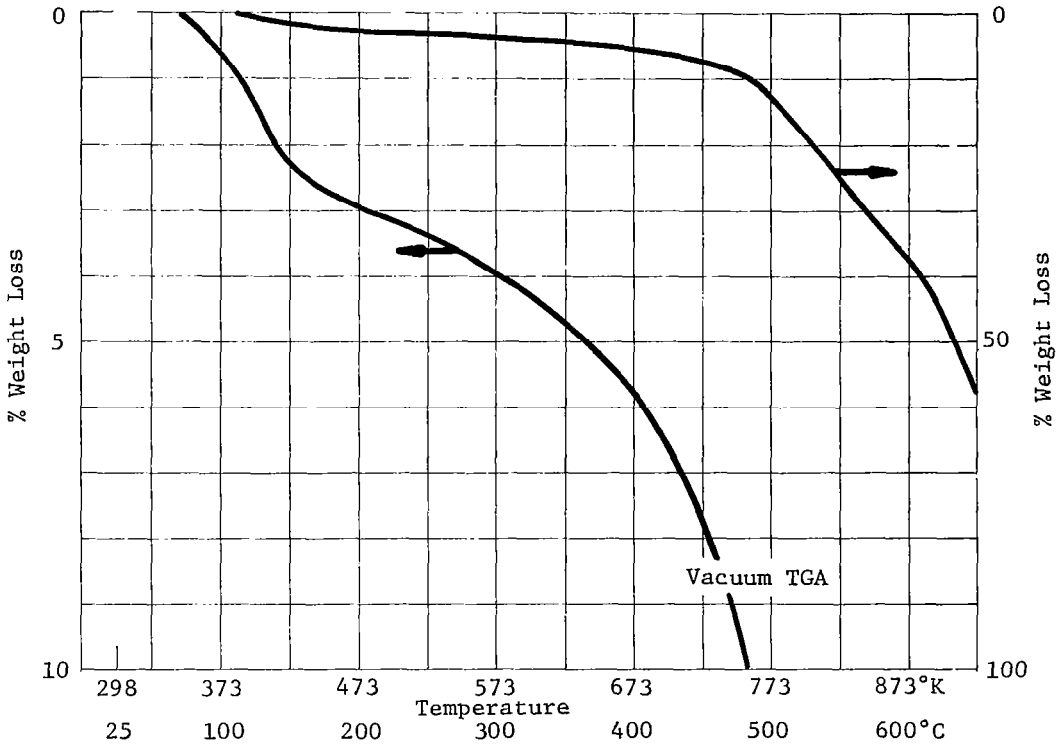
DC93-076 A/B

m/e	Temperature, °K (°C)						
	298 (25)	373 (100)	523 (250)	673 (400)	823 (550)		
128					41		
129					56		
130							
131				57	558		
132				59	752		
133				1386	18986		
134				168	2453		
135				91	1769		
136					63		
137							
138							
139							
140							
141							
142							
143					59		
144							
145					121		
146					80		
147				61	5418		
148				43	738		
149				264	1299		
150					86		
151							
152							
153							
154							
155							
156							
157							
158							
159					61		
160							
161				50	1322		
162					219		
163				52	2835		
164					224		
165				41	756		
166					73		
167							
168							
169							
170							
171							
172							
173							
174							
175					40		
176					452		
177				157	4004		
178					476		
179					735		
180							
181							
182							
183							
184							
185							
186							
187							
188							
189					88		
190					43		
191				303	7118		
192					1102		
193				87	3215		
194							
195					331		
196					82		
197							
198							
199							
200							
201							
202							
203							
204					59		
205					52		
206					40		
207					52		
208				3331	45534		
209				312	8687		
210				215	5058		
211					353		
212					60		
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 1 pbw Resin to 2 pbw Catalyst
Cure: 24 hrs. at room temperature, 2 hrs. at 366°K (93°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1023°K (750°C)

a_o = 70.9% of initial weight

$$k = 9.34 \times 10^3 \exp\left(\frac{-20,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.1×10^9	
373°K (100°C)	4.5×10^7	
423°K (150°C)	1.8×10^6	

Number and Relative Peak Intensity

Temperature, ^{0}K (^{o}C) DC93-076 A/B

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	3208	6188	11540	17833	16371		
15	1684	10142	26576	50855	44420		
16	11402	13070	17976	28928	28222		
17	37720	25952	23290	25500	26385		
18	100766	79447	67360	72961	74675		
19	179	224	256	256	253		
20	928	812	828	1054	1119		
21							
22							
23							
24		251	548	1169	1088		
25	86	1069	2040	4135	3594		
26	794	5263	9464	18802	16304		
27	1329	5252	6454	12739	10758		
28	38656	45025	49900	69123	66663		
29	622	3576	4189	9540	7539		
30	1484	1834	1664	2375	2157		
31		633	366	1077	886		
32	10160	7897	6923	7753	7919		
33							
34					43		
35							
36			41	109	86		
37		209	226	461	322		
38		372	354	701	538		
39		2109	1408	2361	1963		
40	8220	8619	8447	11381	11431		
41	93	3389	1154	1677	1534		
42	130	944	676	1321	1133		
43	126	2547	1415	3828	3127		
44	2356	2788	2363	3426	3586		
45		1184	3386	14569	11691		
46		104	147	864	691		
47		332	649	2085	1716		
48				89	60		
49		69	58	134	86		
50		372	412	520	332		
51		338	464	587	370		
52		218	349	493	340		
53		201	157	309	255		
54		92	52	115	118		
55		516	250	590	539		
56		886	165	242	253		
57		173	197	623	490		
58		270	286	1101	902		
59		347	2265	10135	8137		
60			213	959	753		
61		315	1838	5689	4319		
62			85	363	266		
63			153	407	274		
64	75	86					
65	69	88	134				
66	123	166	297	727	592		
67		70	107	260	255		
68				73	51		
69				106	91		
70				108	76		
71			226	892	681		
72			274				
73		795	8650	76574	60310		
74		169	1243	7908	5992		
75		2227	3482	11975	9234		
76		125	259	806			
77		223	462	913	657		
78		549	965	882	428		
79		62	114	241	239		
80							
81		163	1146	3470	2566		
82		120	674	2191	1557		
83		43	124	474	372		
84	238	230	225	410	419		
85			173	836	637		
86		41	109	350	265		
87		122	1256	4231	3178		
88		81	743	2330	629		
89		282	2104	6278	4531		
90			193	722	451		
91		53	443	984	535		
92			71	168	84		
93							
94							
95							
96		1730	12374	34545	24278		
97		130					
98					76		
99				77			
100							
101			54	322	185		
102			333	1156	775		
103		359	2440	7481	5188		
104		42	531	1672	1223		
105		80	678	2289	1602		
106			40	207	132		
107			40	232	157		
108							
109							
110				152	66		
111			43	278	167		
112				96	60		
113				97	45		
114							
115		126	1147	3644	2496		
116			117	535	369		
117			537	1945	1361		
118			113	726	486		
119		216	1987	6023	4167		
120			184	693	482		
121			167	687	430		
122							
123							
124							
125			95	783	459		
126				202	140		
127			40	57			

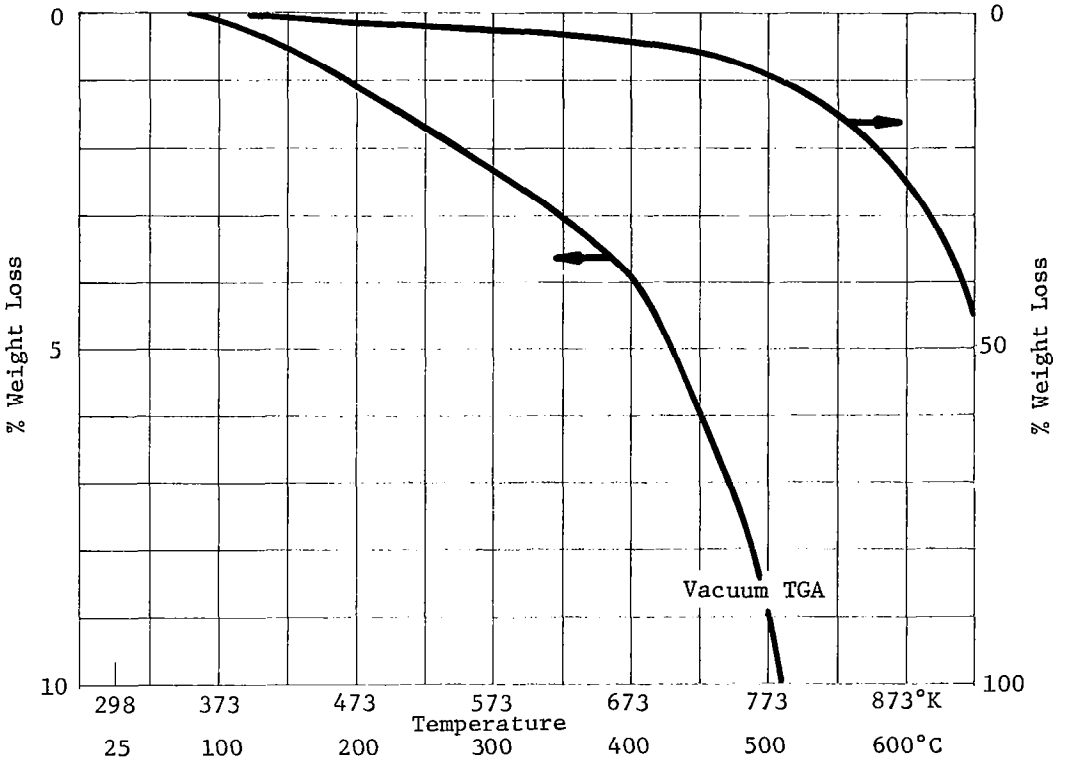
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)					DC93-076 A/B	
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	271	275	316	519	472		
130							
131	191	207	359	909	710		
132	252	281	479	989	804		
133		681	4404	13248	9367		
134	46	132	626	1917	1360		
135			316	1211	814		
136			82	134	125		
137							
138							
139							
140							
141							
142							
143							
144							
145				110	58		
146				107	63		
147		56	709	2760	1950		
148			60	395	283		
149			161	661	437		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			113	457	272		
162				106	50		
163			254	910	565		
164				100	49		
165			56	327	170		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176				68			
177			142	563	325		
178				57			
179				89	41		
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191			109	399	191		
192							
193				116	46		
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207			88				
208				368	199		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 1 pbw Resin to 2 pbw Catalyst
Cure: 20 hrs. at room temperature, 4 hrs. at 343°K (70°C), 5 days at room temperature, 4 hrs. at 366°K (93°C), 6 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 1023°K (750°C)

a_o = 72.3% of initial weight

$$k = 3.64 \times 10^3 \exp\left(\frac{-19,100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.6×10^9	
373°K (100°C)	3.0×10^7	
423°K (150°C)	1.4×10^6	

Number and Relative Peak Intensity

Temperature, °K (°C) — DC93-076 Type I

m/e	298 (25)	473 (200)	673 (400)	773 (500)			
14	1410	1503	2052	3121			
15	444	476	2378	7641			
16	3845	3448	4111	6574			
17	19817	14870	12935	11715			
18	70578	50608	43337	38157			
19	83	94	155	164			
20	427	392	346	420			
21							
22							
23							
24			84	274			
25		73	440	1078			
26	202	546	2476	4973			
27	512	731	3211	3327			
28	31311	30048	35571	43027			
29	643	785	2696	3437			
30	1054	1707	1247	1326			
31	396	566	1225	709			
32	7034	6201	5997	5748			
33							
34							
35							
36				45			
37			129	139			
38			266	203			
39	83	200	1787	928			
40	3434	3163	3875	4029			
41	80	181	3279	979			
42	73	117	794	499			
43	142	256	3073	1565			
44	952	955	1491	1435			
45		146	1728	3660			
46			192	200			
47			680	790			
48							
49			90	62			
50		70	386	231			
51		49	321	430			
52			186	278			
53			219	129			
54			78	50			
55		54	661	336			
56			936	198			
57			256	206			
58			328	377			
59			511	2606			
60			81	250			
61			429	2258			
62				151			
63			58	147			
64							
65			67	153			
66			56	212			
67			154	154			
68							
69			60	67			
70			62	51			
71			48	376			
72			49	399			
73			1536	12651			
74			276	1760			
75		53	5022	5850			
76			341	390			
77		85	421	718			
78			551	817			
79			108	197			
80							
81			167	1615			
82			107	997			
83			58	175			
84				41			
85			44	255			
86				123			
87			231	2158			
88			97	1279			
89			416	3593			
90			56	334			
91			163	902			
92				117			
93							
94				67			
95							
96			2789	22627			
97							
98							
99				46			
100							
101				188			
102			46	723			
103			628	4942			
104			100	1110			
105			199	1576			
106				157			
107				178			
108							
109							
110				47			
111				117			
112				43			
113				48			
114							
115			353	2781			
116				365			
117			123	1398			
118			45	527			
119			589	4845			
120			49	527			
121			53	551			
122				40			
123							
124							
125				336			
126				101			
127			90	406			

Number and Relative Peak Intensity (Continued)

Temperature, °K (°C)

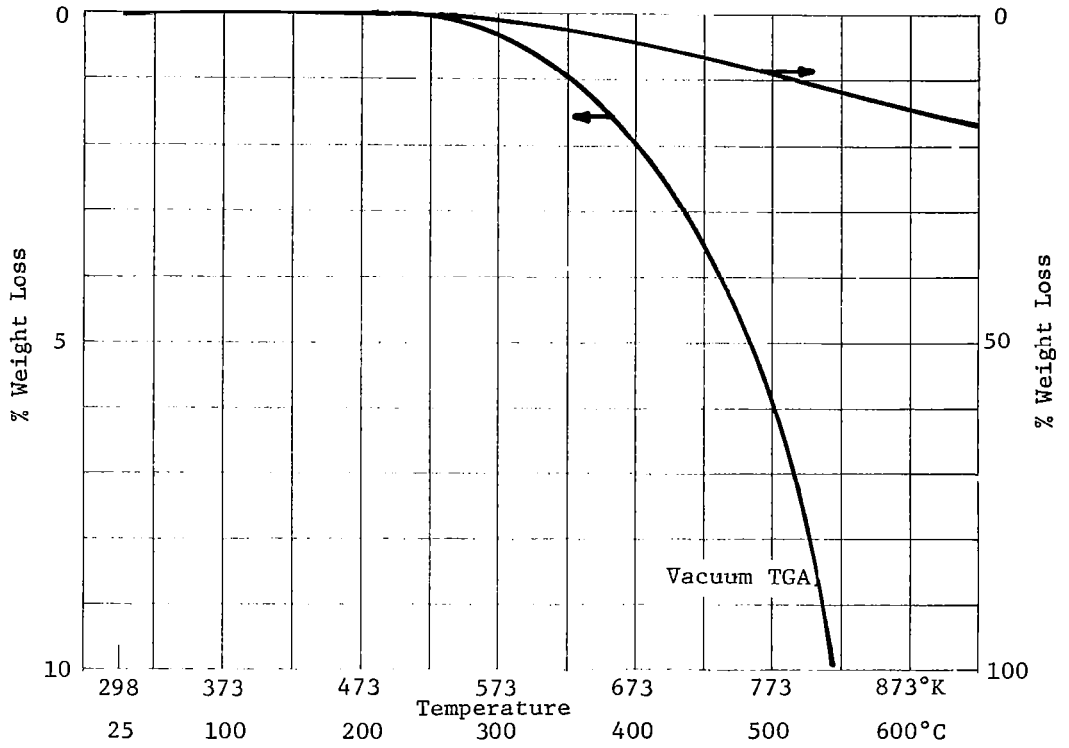
DC93-076 Type I

m/e	298 (25)	473 (200)	673 (400)	773 (500)			
128				67			
129				111			
130							
131			60	527			
132			88	761			
133			2023	13347			
134			244	1803			
135			128	1237			
136				87			
137							
138							
139							
140							
141							
142							
143				47			
144							
145				150			
146				185			
147			360	3008			
148'			50	509			
149			481	1164			
150				110			
151				81			
152							
153							
154							
155							
156							
157							
158							
159				62			
160							
161			68	1067			
162				324			
163			213	2017			
164				319			
165			65	872			
166				85			
167				44			
168							
169							
170							
171							
172							
173							
174							
175				115			
176				526			
177			303	3383			
178				683			
179			50	674			
180				53			
181							
182							
183							
184							
185							
186							
187							
188							
189				243			
190				124			
191			699	6230			
192			104	1215			
193			226	1482			
194				412			
195				204			
196							
197							
198							
199							
200							
201							
202							
203				66			
204							
205				81			
206				71			
207			5006	40560			
208			909	8044			
209			532	4688			
210			42	539			
211				89			
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222				57			
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 10 pbw of Hardener
Cure: 24 hrs. at room temperature plus 4 hrs. at 338°K (65°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 853°K (580°C)

a_o = 12.5% of initial weight

$$k = 4.2 \times 10^2 \exp\left(\frac{-12{,}750}{1.98\ T°K}\right)\ min^{-1}$$

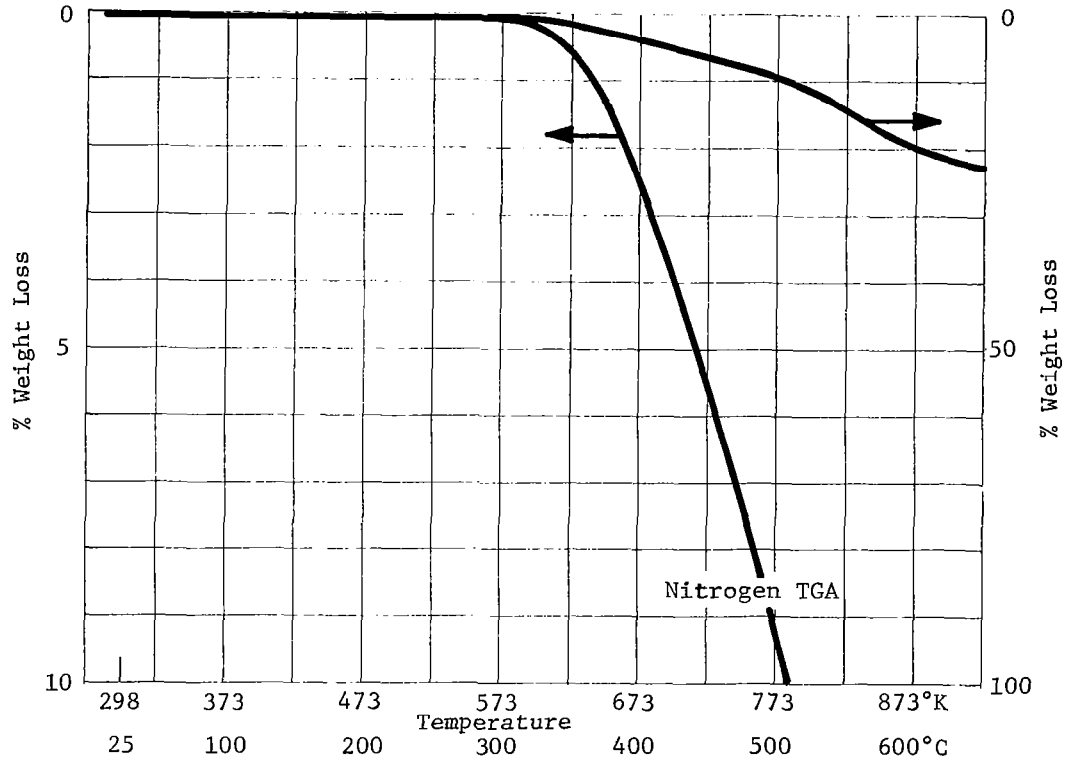
Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	6.6×10^5	
373°K (100°C)	4.5×10^4	
423°K (150°C)	5.8×10^3	

Chemical Characterization Summary

Mix Ratio: 100 pbw of Resin to 10 pbw of Hardener
Cure: 24 hrs. at room temperature plus 4 hrs. at 338°K (65°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 753°K (480°C)

a_o = 10% of initial weight

$$k = 1.0 \times 10^{2} \exp\left(\frac{-15,750}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	3.0×10^{8}	
373°K (100°C)	1.1×10^{7}	
423°K (150°C)	8.7×10^{5}	

Number and Relative Peak Intensity

Temperature, °K (°C)

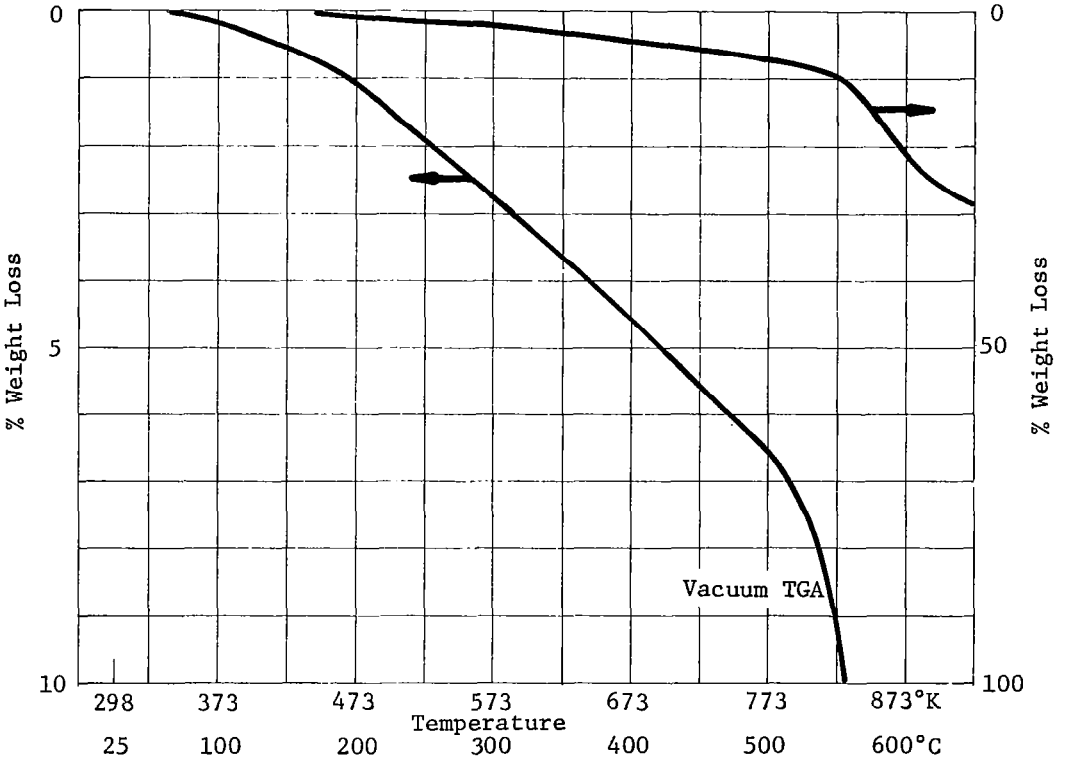
DC93-500

m/e	298 (25)	423 (150)	623 (350)	823 (550)			
14	895	866	1355	4117			
15	192	210	2041	14292			
16	2741	2684	4720	19206			
17	8786	7669	7305	7087			
18	27450	23652	21323	19257			
19	283	344	336	446			
20	176	159	169	173			
21							
22							
23							
24				47			
25			47	191			
26	85	115	318	1532			
27	229	257	496	1612			
28	14188	13971	14779	17521			
29	1767	1722	1471	1450			
30	1837	1791	1634	1632			
31			58				
32	3355	3178	3051	2993			
33							
34							
35							
36				50			
37							
38			43	81			
39			60	234			
40	1207	1267	1368	1721			
41			52	231			
42				148			
43	51	59	124	147			
44	653	695	698	670			
45		41	158	280			
46			56	43			
47							
48							
49							
50			48	73			
51			52	66			
52			47				
53							
54							
55							
56							
57							
58							
59			50	102			
60							
61				41			
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73			155	432			
74				53			
75			258	155			
76							
77			47	66			
78			111	100			
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 698°K (425°C) - 1073°K (800°C)

a_o = 35.1% of initial weight

$$k = 7.93 \times 10^{7} \exp\left(\frac{-34,200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.3×10^{15}	
373°K (100°C)	1.0×10^{12}	
423°K (150°C)	4.2×10^{9}	

Number and Relative Peak Intensity

Temperature, °K (°C) — E058R Elastomer

m/e	298 (25)	473 (200)	673 (400)	773 (500)	873 (600)	923 (650)	
14	1354	1301	1475	2211	2901	3208	
15	505	459	1440	4609	6825	8845	
16	2391	2137	2709	4172	5125	8100	
17	10390	8516	7699	6691	6070	6013	
18	27297	30515	26897	23260	21081	20431	
19							
20	64	48	47	48	52	45	
21							
22							
23							
24				50	82	70	
25			75			612	
26	186	246	876	2872	3914	3591	
27							
28	20708	19651	20383	23114	25410	24200	
29	840	715	996	1447	1990	1795	
30		111	139		180	201	
31							
32	5498	4914	4429	4044	4161	3863	
33							
34							
35							
36							
37				79	62		
38				136	124	65	
39							
40	929	879	934	1130	1219	1155	
41			171	154	134	317	
42			87	120		168	
43			282	361	526	630	
44	381	370					
45			982	1667	2038	1836	
46							
47			488	446	207	123	
48							
49				50			
50			78	530	474	119	
51			76	575	543	140	
52			58	458	441	87	
53							
54							
55							
56							
57							
58					43	79	
59			51	590	1204	1467	
60					46	52	
61				358	656	486	
62							
63				46	64		
64							
65				40	62	50	
66				46	59	74	
67							
68							
69							
70							
71						45	
72						50	
73			61	3851	8175	8058	
74							
75			4230	3936	2384	1595	
76			186			56	
77			194			194	
78			318	2386	1978	372	
79				58	73		
80							
81				146	434	288	
82				91	178	159	
83							
84							
85							
86							
87				198	453	376	
88				95	228		
89				381	804	606	
90							
91				41	252	178	
92							
93						40	
94							
95							
96			46	3976	6702	5408	
97							
98							
99							
100							
101							
102				44	72		
103				568	1073	843	
104				59	134	88	
105				118	199	161	
106					492		
107							
108							
109							
110							
111							
112							
113							
114							
115							
116				180	492	371	
117				62		55	
118					131	111	
119					63		
120				531	1001	830	
121							
122							
123							
124							
125				41		55	
126					68	57	
127							

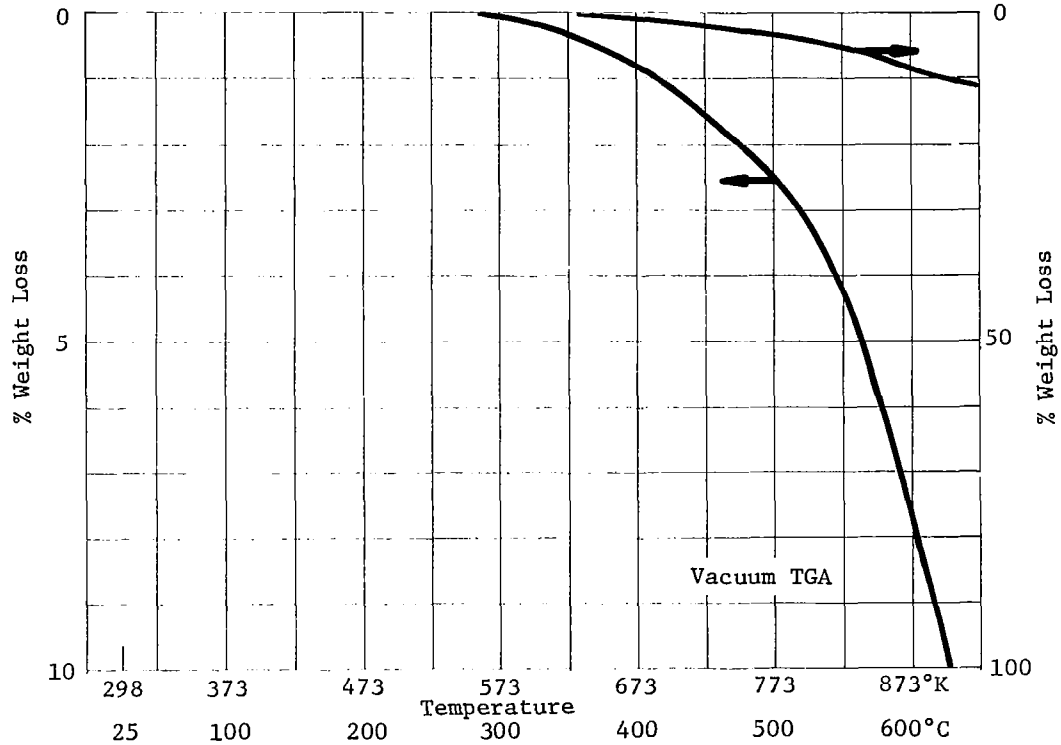
Number and Relative Peak Intensity (Continued)

E058R Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	473 (200)	673 (400)	773 (500)	873 (600)	923 (650)	
128							
129					40	50	
130							
131							
132	49			49	86	85	
133				107	241	210	
134				2089	3285	2691	
135					305	240	
136				40	118	81	
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173				300			
174							
175					567	298	
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary
Mix Ratio: 55 pbw RTV511, 45 pbw ZnO, 0.75 pbw V1747 Black Pigment
0.5 pbw Catalyst
Cure: 24 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs, at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Condensible degassing = 2.1×10^{-6}%/day

Isothermal weight loss in nitrogen = 0.10%

Number and Relative Peak Intensity

Temperature, °K (°C)

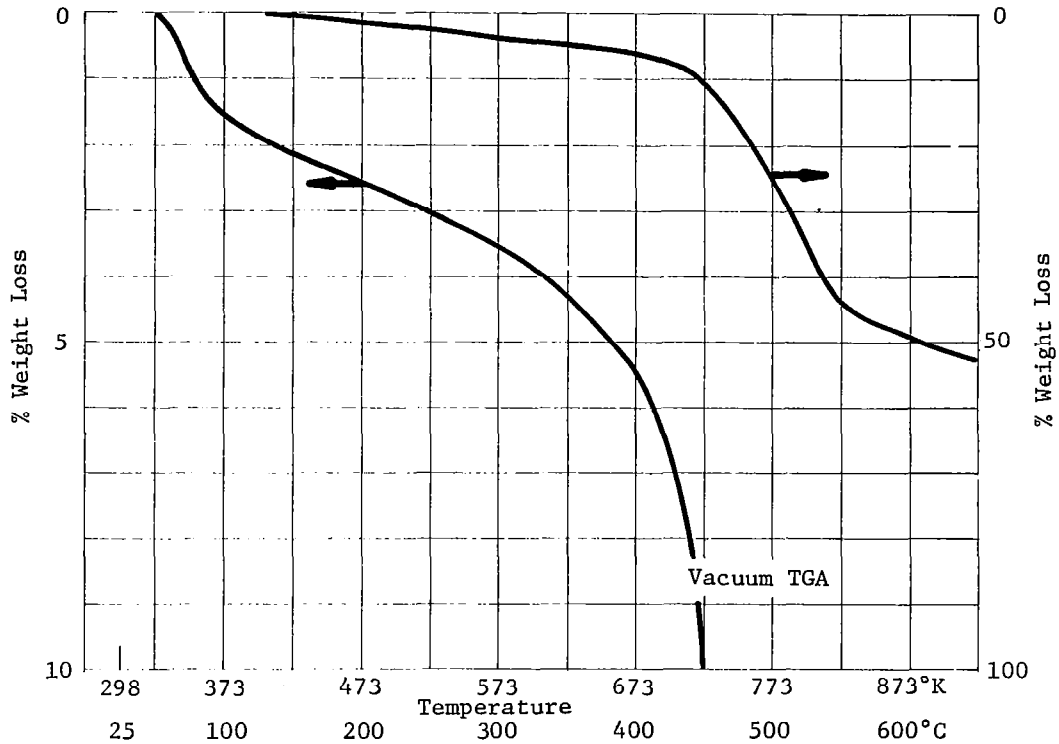
Gray Silicone Coating

m/e	298 (25)	573 (300)	773 (500)	923 (650)			
14	820	899	1249	2764			
15	160	219	1264	7233			
16	3610	3413	3922	8388			
17	16051	12499	10085	9773			
18	55838	41632	32305	30143			
19	45		74	77			
20	126	149	131	154			
21							
22							
23							
24				52			
25			81	228			
26	84	176	630	2163			
27	172	336	479	1384			
28	18215	17953	18338	23562			
29	126	209	244	530			
30	558	645	609	664			
31		70	43	79			
32	4502	3911	3435	3312			
33							
34							
35							
36							
37			60				
38			79	48			
39		65	292	210			
40	1662	1677	1744	1849			
41		89	61	164			
42			42	85			
43		105	80	246			
44	240	385	921	780			
45			60	344			
46							
47							
48							
49							
50			298	43			
51			275	52			
52			268				
53							
54							
55							
56							
57							
58				65			
59				307			
60							
61				104			
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73			105	1513			
74			42	71			
75				166			
76							
77			144				
78			1195	70			
79							
80							
81				41			
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96			51	338			
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: Proprietary
Cure: 24 hrs. at room temperature

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 973°K (700°C)

a_o = 49.7% of initial weight

$$k = 3.59 \times 10^8 \exp\left(\frac{-33{,}000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.6×10^{13}	
373°K (100°C)	4.4×10^{10}	
423°K (150°C)	2.3×10^{8}	

Isothermal weight loss in nitrogen = 1.84%

Number and Relative Peak Intensity

Temperature, °K (°C)

Heat Shield Joint Sealant JS-220

m/e	298 (25)	523 (250)	623 (350)	723 (450)	823 (550)	923 (650)	
14	3651	3654	4589	15264	10900	7077	
15	2117	2545	6067	47531	24553	14697	
16	12039	12298	14598	52754	22276	20859	
17	37992	35533	31650	29614	28767	27079	
18	100624	100689	98065	87454	83700	80078	
19	927	865	855	778	458	451	
20	1010	966	1009	1124	1008	974	
21							
22							
23							
24			73	747	696	150	
25	72	194	433	2590	2473	731	
26	864	1388	2384	12157	11563	3663	
27	1630	1578	2299	6419	7018	3096	
28	49463	49282	51225	65478	64239	51183	
29	874	952	1136	2964	3826	1436	
30	1528	1686	1745	2018	1939	1538	
31	81	153	142	434	760	225	
32	11077	11003	10457	9513	9089	8946	
33							
34							
35							
36				209	104		
37			164	1525	346	107	
38		53	295	2054	569	181	
39	257	303	958	5375	1965	808	
40	9529	9905	9983	11692	10666	10031	
41	205	280	323	941	1018	660	
42	136	191	253	614	796	419	
43	206	261	424	1267	2014	735	
44	2999	2966	2887	2702	2625	2159	
45		73	287	3994	6211	1043	
46				235	347		
47				476	916	263	
48				83			
49			79	985	146		
50		65	907	6264	1020	294	
51		49	954	6935	1219	333	
52			845	6135	901	212	
53				345	254	75	
54					76		
55			41	201	334	125	
56				82	113	48	
57				153	259	53	
58			51	278	505	101	
59			242	2967	4938	794	
60				282	418	53	
61			40	1397	1782	217	
62				301	141		
63			114	1289	321	59	
64	85	80	68	145			
65			81	280	405	127	
66	112	130	132	303	474	205	
67				118	177	63	
68					44		
69					54		
70							
71				167	303		
72							
73			874	25019	33184	3110	
74			192	3587	3263	303	
75			343	3536	5219	1533	
76			130	1241	434	85	
77			743	5172	1110	303	
78	56	124	3288	22462	2480	645	
79			154	1431	203	51	
80				60	63		
81				675	951	71	
82				396	589	74	
83				131	230	80	
84	219	237	245	306	299	240	
85				234	414		
86			41	102	166		
87				940	1305	104	
88				431	641		
89				1267	1781	146	
90				89	164		
91				1031	1472	259	
92				374	425	58	
93							
94							
95							
96			197	6774	8706	976	
97						83	
98				46			
99							
100							
101					88		
102				170	291		
103				1604	2192	223	
104				314	514		
105				454	724	62	
106					44		
107					68		
108							
109							
110							
111					67		
112							
113							
114							
115				734	951	57	
116				56	120		
117				508	628		
118				143	203		
119				1318	1745	139	
120				98	172		
121				99	179		
122							
123							
124							
125				199	364		
126					87		
127				70	88		

Number and Relative Peak Intensity (Continued)

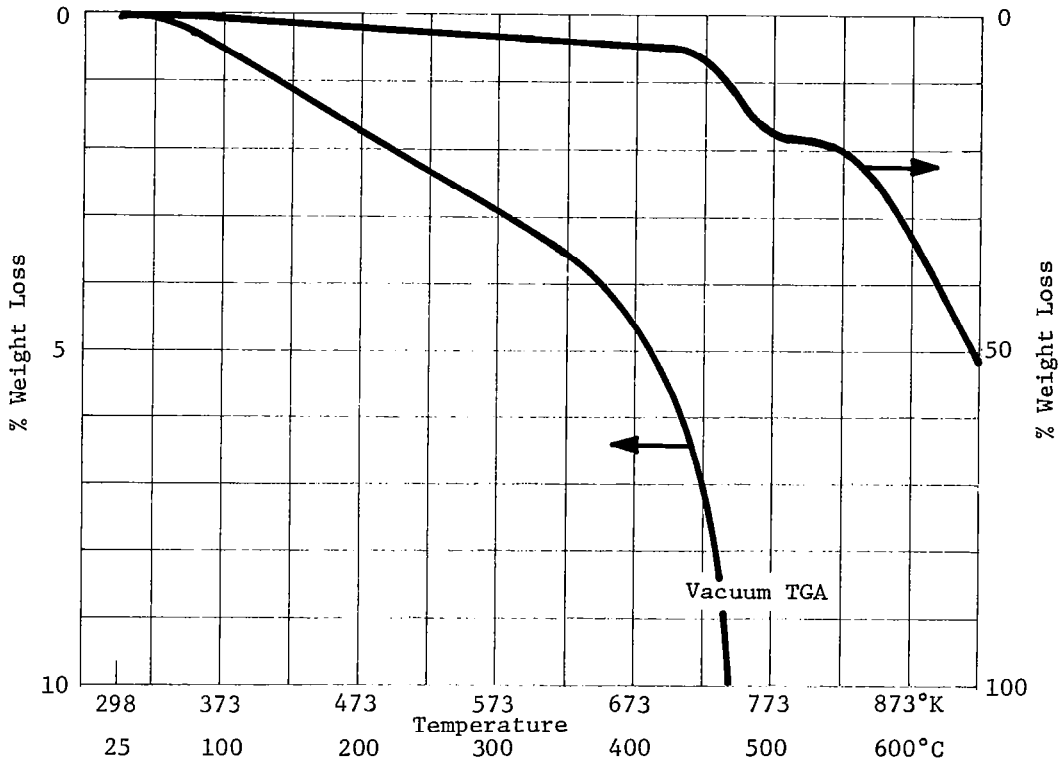
Heat Shield Joint Sealant JS-220

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)	823 (550)	923 (650)	
128							
129	282	300	312	413	414	324	
130							
131	218	200	217	450	554	320	
132	258	279	282	504	535	290	
133			56	3043	3992	427	
134	60	49	51	460	589	100	
135				282	614		
136					90		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147				791	1182	68	
148				65	139		
149				108	238		
150							
151							
152							
153							
154					45		
155							
156							
157							
158							
159							
160							
161				54	66		
162							
163				112	182		
164							
165					54		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				61	107		
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192					58		
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208					48		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 298°K (25°C) - 723°K (450°C)

a_o = 14% of initial weight

$$k = 3.5 \times 10^{8} \exp\left(\frac{-32{,}000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	9.6×10^{12}	
373°K (100°C)	1.2×10^{10}	
423°K (150°C)	6.6×10^{7}	

Number and Relative Peak Intensity

MS40G08

m/e	Temperature, °K (°C) 298 (25)	473 (200)	723 (450)	823 (550)	923 (650)		
14	1933	1858	3936	4512	6325		
15	276	324	9408	10575	17219		
16	2564	2348	5344	5832	9203		
17	9926	7752	5922	5513	5369		
18	33943	26347	19261	17467	16897		
19	148	170	229	225	210		
20	175	163	152	163	186		
21							
22							
23							
24			208	200	335		
25			813	819	1298		
26	94	148	3903	4134	6091		
27							
28	21719	10672	29333	18529	32287		
29	266	330	2621	2384	3454		
30	268	260	453	401	551		
31					375		
32	5290	4873	4002	3788	3752		
33							
34							
35							
36							
37			40		56		
38			75	55	90		
39			309		513		
40	1481	1426	1754	1784	2006		
41			175	193	282		
42			183	155	297		
43		48	766	673	1168		
44	322	370	611	709	832		
45			2362	2157	4045		
46			74	82	200		
47			410	315	599		
48							
49							
50			107	55	63		
51			117	71	61		
52			100	52	52		
53				43	51		
54							
55			56	44	80		
56							
57			69	49	113		
58			130	109	247		
59			1402	1246	2802		
60			86	78	172		
61			1270	944	1464		
62			50		52		
63			59	43	58		
64							
65			55				
66			90	70	109		
67							
68							
69							
70							
71			109	78	152		
72			112	93			
73			3795	4639	17378		
74			575	525	1666		
75			1916	1500	2672		
76			89	60	108		
77			112	73	94		
78			222	85	54		
79					62		
80							
81			661	420	100		
82			335	262	370		
83			45		50		
84	43		47	47	69		
85			66	44	107		
86							
87			655	475	737		
88			381	228	362		
89			1081	781	1077		
90			82	45	73		
91			61	46	47		
92							
93							
94							
95							
96			5919	4160	5440		
97			621	419	567		
98							
99							
100							
101							
102			117	69	99		
103			1069	750	1003		
104			186	117	169		
105			242	139	212		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			312	226	304		
116							
117			86	74	102		
118							
119			484	344	418		
120							
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

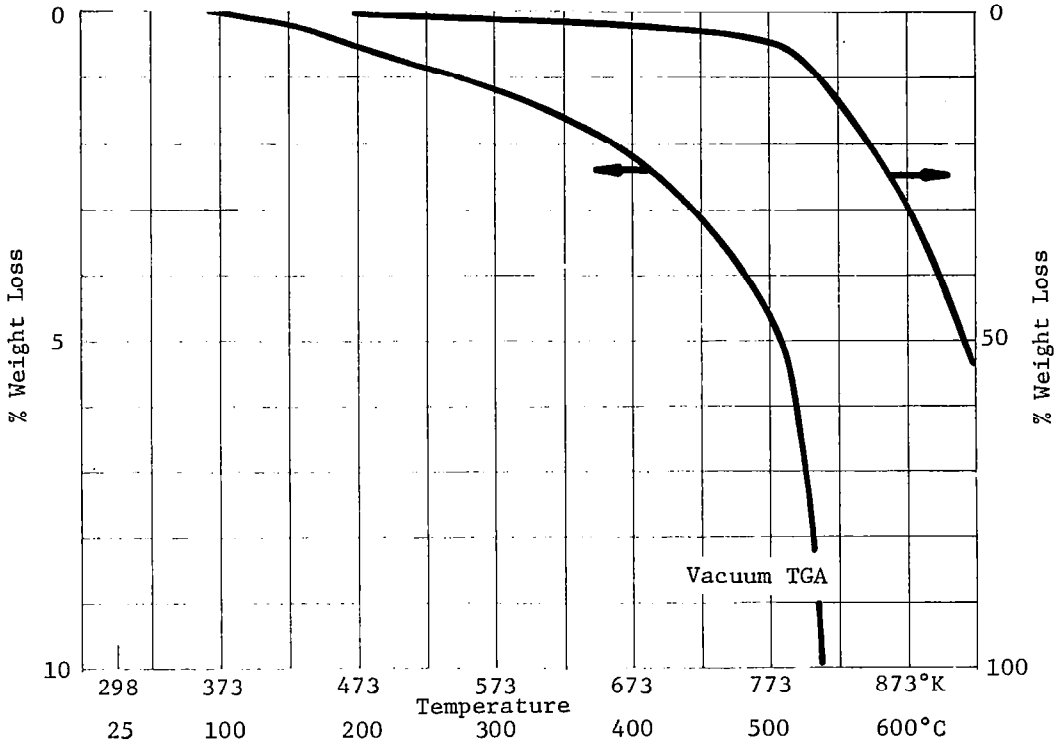
Temperature, ^{o}K (^{o}C) MS40G08

m/e	298 (25)	473 (200)	723 (450)	823 (550)	923 (650)		
128							
129							
130							
131							
132							
133			522	293	422		
134			415		369		
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 1023°K (750°C)

a_o = 59.6% of initial weight

$$k = 8.33 \times 10^{8} \exp\left(\frac{-38,600}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.1×10^{17}	
373°K (100°C)	3.4×10^{13}	
423°K (150°C)	7.1×10^{10}	

Number and Relative Peak Intensity

Temperature, °K (°C)

MS50S14

m/e	298 (25)	673 (400)	773 (500)	873 (600)	1023 (750)		
14	576	626	940	1520	1232		
15	89	261	1759	5380	1713		
16	1187	1202	1504	2203	2645		
17	2159	1965	2223	2601	2210		
18	4844	4454	5567	6657	5103		
19	1087	1572	2197	1623	4176		
20		51	88	135	328		
21							
22							
23							
24				105	63		
25			98	316	162		
26		71	441	1502	571		
27		123	561	1828	574		
28	1607	2163	4127	7288	4456		
29	44	78	566	1980	283		
30	190	236	364	526	378		
31			47		537		
32	482	607	848	1076	935		
33					139		
34							
35							
36							
37			50	106	85		
38					106		
39				451	307		
40	190	258	473	666	549		
41			81	205	148		
42							
43				695			
44	104	170			892		
45		137	632	2577	487		
46							
47		60	189	400	339		
48							
49							
50			128				
51			167	502	631		
52			91	248	55		
53				97	50		
54							
55				107	89		
56					138		
57					181		
58							
59			369	2256	167		
60					47		
61			189	867	63		
62							
63			57	202			
64					372		
65			65	317	107		
66				125	70		
67					77		
68					49		
69				48	740		
70					43		
71				225			
72							
73			1926	19464	652		
74				2595			
75		285	986	2638	553		
76							
77			253	888	502		
78			260	748	127		
79			46	136	132		
80							
81			103	568	627		
82			55	306	116		
83				111	81		
84							
85			44	222	132		
86							
87			133	733	83		
88					104		
89			216	1088	105		
90					57		
91			277	1597	73		
92			49	270			
93				54	113		
94							
95					271		
96			919	4887	206		
97					42		
98							
99				42	56		
100					87		
101			46		108		
102							
103			370	1779	62		
104			135	610			
105			125	669	48		
106				123	50		
107				132			
108				45	93		
109				46			
110				83			
111				107			
112				86			
113				72	550		
114					94		
115			220	1046	71		
116							
117			119	610			
118							
119			344	1698	135		
120			68	325	45		
121			57	276	40		
122				54			
123				44			
124							
125			68	308	103		
126					73		
127			89	398	41		

Number and Relative Peak Intensity (Continued)

MS50S14

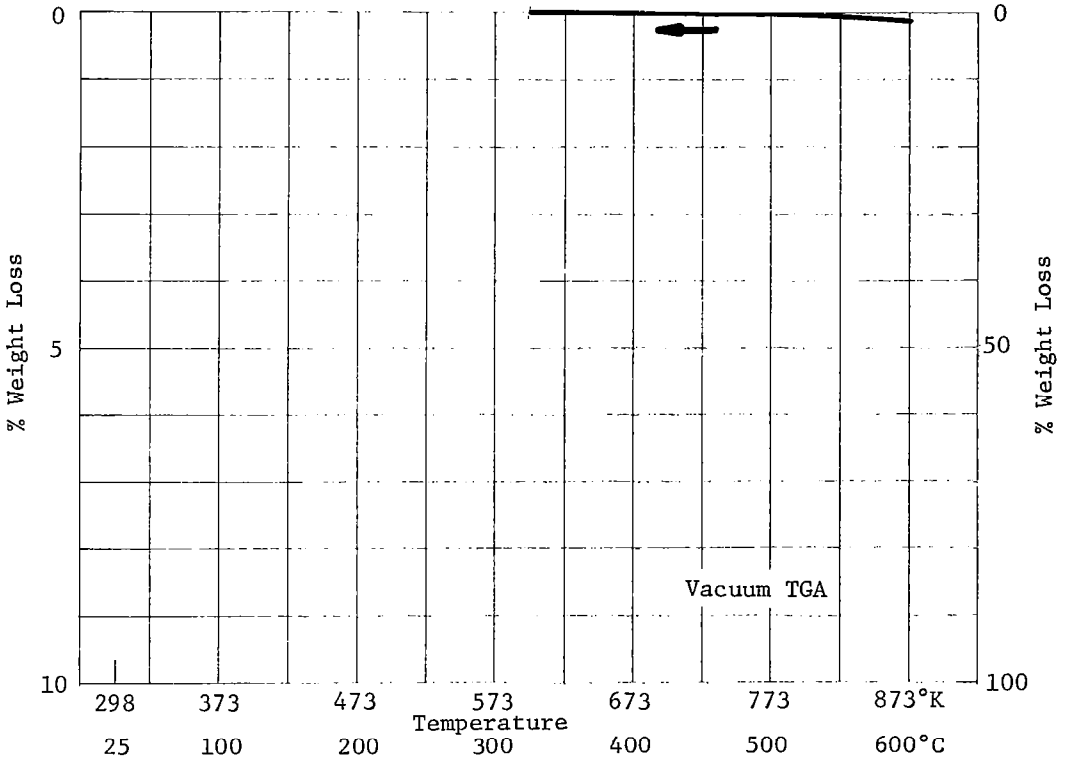
m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	1023 (750)		
128							
129				78			
130							
131			74	366	83		
132							
133			1103	5130	189		
134			239	1316	51		
135					52		
136					45		
137					53		
138							
139					75		
140							
141							
142							
143				66			
144					104		
145				183	84		
146							
147			327	2467	90		
148				647			
149			109		46		
150				112	61		
151				80	62		
152							
153							
154							
155				78	67		
156				97	55		
157					79		
158					41		
159				80			
160							
161			134	591			
162							
163			268	1218	254		
164				560	43		
165			128				
166							
167				70			
168							
169					41		
170				41			
171							
172							
173							
174							
175					57		
176					62		
177			447	1944	70		
178			168	727			
179							
180			45	166			
181							
182							
183							
184							
185							
186							
187							
188							
189			74		42		
190							
191			1052	3990	113		
192			744	3095	101		
193					72		
194							
195							
196							
197				42			
198							
199							
200							
201							
202							
203				118			
204							
205							
206							
207		106	7047	26770	747		
208							
209							
210							
211			40				
212							
213							
214							
215							
216							
217							
218							
219				42			
220							
221							
222			46	181			
223							
224				60			
225				49			
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237				120			
238							
239				107			
240							

Nash M9810 Terminal,
Silicone/Glass

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Nash M9810 Terminal, Silicone/Glass

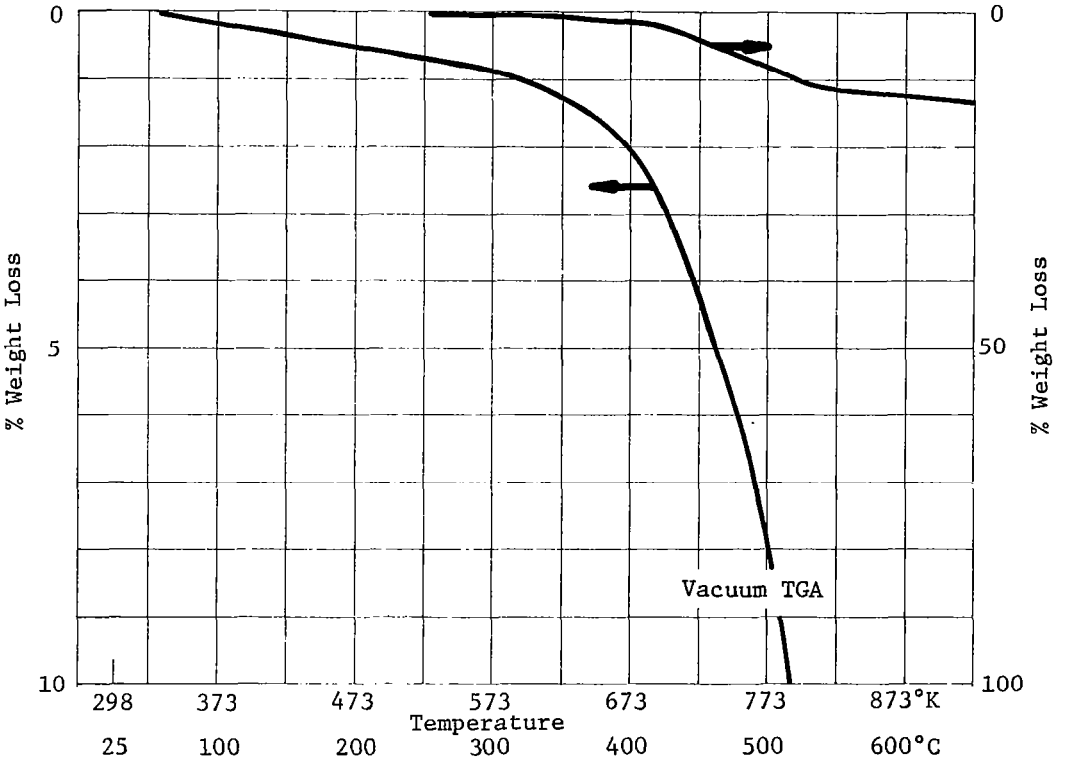
m/e	Temperature, °K (°C)						
	298 (25)	573 (300)	848 (575)				
14	1344	1335	1288				
15	154	198	222				
16	2173	1986	1919				
17	8550	6876	5529				
18	31179	24662	19618				
19	67	94	149				
20	64	51	43				
21							
22							
23							
24							
25							
26	140	180	189				
27							
28	24112	22731	21746				
29	83	125	126				
30	52	57	73				
31							
32	5344	4605	4245				
33							
34							
35							
36							
37							
38							
39							
40	1250	1188	1132				
41			44				
42							
43							
44	490	723	888				
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Permacel Tape with
Silicone Adhesive

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $423^{o}K$ ($150^{o}C$) - $848^{o}K$ ($575^{o}C$)

a_o = 35.2% of initial weight

$$k = 1.37 \times 10^{10} \exp\left(\frac{-38,100}{1.98\ T^{\circ}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	3.3×10^{15}	
$373^{o}K$ ($100^{o}C$)	1.1×10^{12}	
$423^{o}K$ ($150^{o}C$)	2.5×10^{9}	

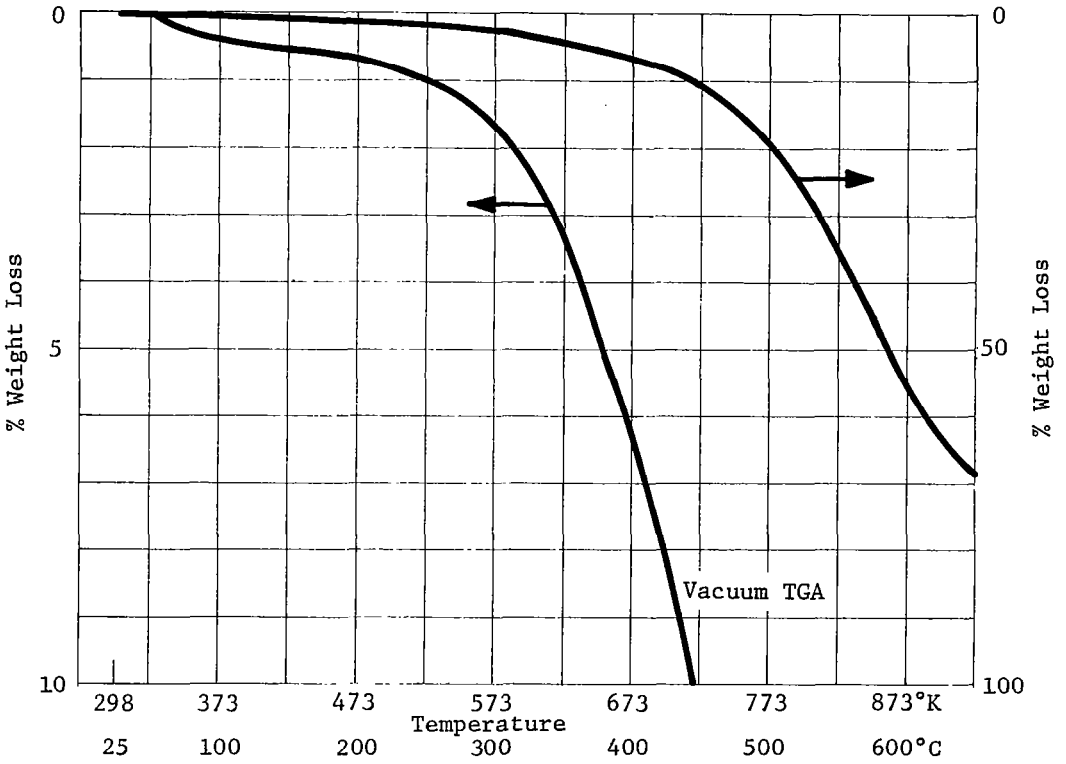
	Number and Relative Peak Intensity						
	Temperature, °K (°C)					Permacel Tape with Silicone Adhesive	
m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	680	550	936	2278	1822		
15	121	150	1076	4281	3306		
16	3543	3452	3576	4592	11854		
17	13787	12130	10537	9622	17274		
18	46331	39562	33629	29149	44057		
19		43	46	63			
20	82	65	82	77	55		
21							
22							
23							
24				52			
25		47	47	192	163		
26	57		313	1435	3034		
27	192	164	307	888	7171		
28	11023	10702	11304	13740	64066		
29		80	204	336	968		
30	926	860	911	917	1505		
31				48			
32	3778	3627	3275	2905	4268		
33							
34							
35							
36							
37				40	74		
38				59	148		
39			47	145	799		
40	1055	1046	974	1114	2201		
41			64	181	150		
42			55	128	106		
43	40	42	113	172	608		
44	434	536	754	1312	20092		
45			266	588	783		
46							
47			129	80	242		
48							
49							
50					362		
51				45	297		
52					143		
53							
54							
55							
56							
57							
58				49			
59			44	218	80		
60				41			
61				77	59		
62							
63					64		
64							
65					116		
66				107	298		
67							
68							
69							
70							
71							
72							
73			48	2455	368		
74				125	44		
75			962	490	1895		
76			40		200		
77			42	44	97		
78					278		
79							
80							
81							
82							
83							
84							
85							
86							
87				54			
88							
89				51			
90							
91							
92							
93							
94					91		
95							
96				229			
97							
98							
99							
100					48		
101							
102							
103					41		
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 82 pbw ZnO to 40 pbw toluene to 0.5 pbw dilaurate

Cure: 24 hrs. at room temperature followed by 24 hrs. at 397°K (124°C)

1. TGA Preconditioning: 100 hrs. at 398°K (125°C) in N_2 atmosphere



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 69% of initial weight

$$k = 1.1 \times 10^5 \exp\left(\frac{-22{,}500}{1.98\ T°K}\right) \text{ min}^{-1}$$

Time to 1% Weight Loss at Temperature T

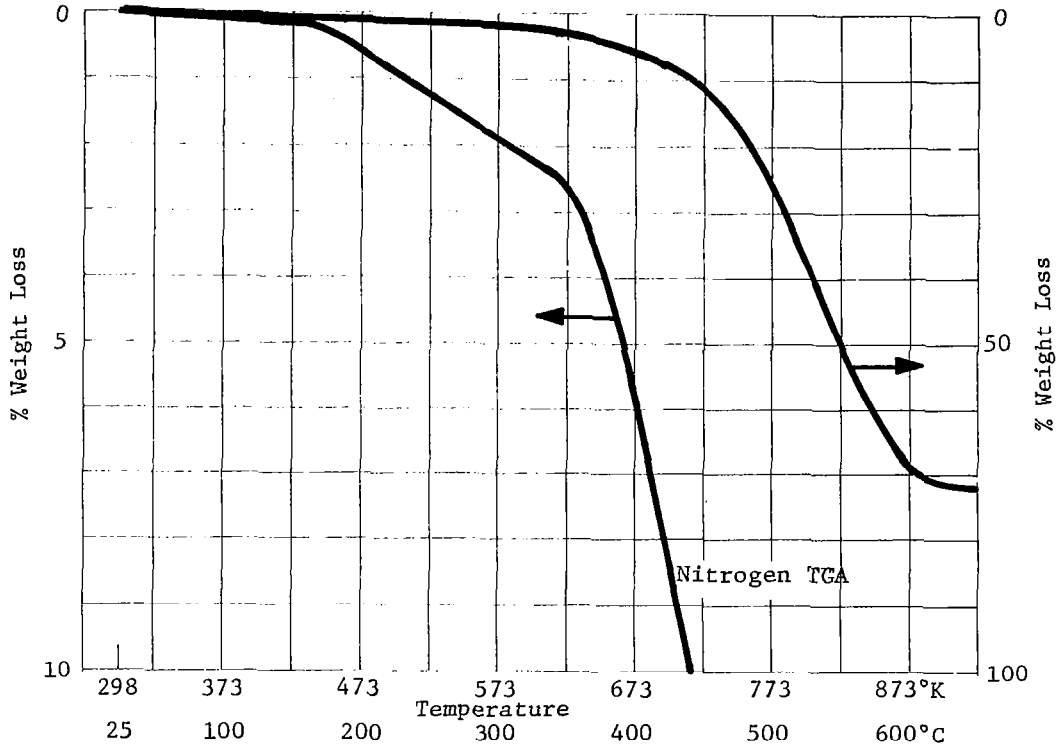
	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.1×10^{10}	
373°K (100°C)	9.6×10^{7}	
423°K (150°C)	2.5×10^{6}	

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 82 pbw ZnO to 40 pbw toluene to 0.5 pbw dilaurate

Cure: 24 hrs. at room temperature followed by 24 hrs. at 397°K (124°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 923°K (650°C)

a_o = 68% of initial weight

$$k = 2.2 \times 10^6 \exp\left(\frac{-26{,}100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)		1.5×10^{11}
373°K (100°C)		6.3×10^{8}
423°K (150°C)		9.1×10^{6}

Number and Relative Peak Intensity

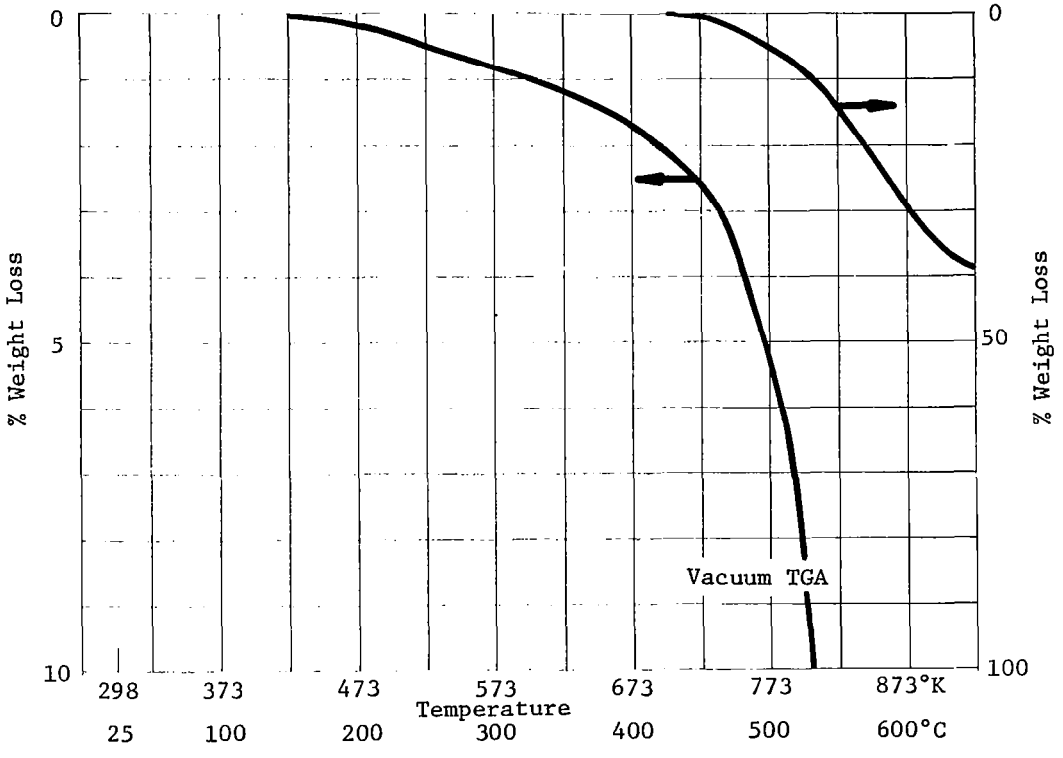
Temperature, °K (°C) RTV-511, Modified

m/e	298 (25)	473 (200)	623 (350)	773 (500)	873 (600)		
14	432	436	911	1491	989		
15	83	86	1262	4545	2715		
16	1718	1662	1782	2751	2178		
17	11201	9482	7261	5744	4756		
18	42528	35361	26105	17789	16362		
19		42					
20	72	55	50				
21							
22							
23							
24				76	48		
25			87	366	164		
26		47	952	2487	1418		
27	90	117	268	936	414		
28	11522	11322	11845	12338	9579		
29	100	113	215	842	350		
30	250	282	270	215	178		
31	45	47	47	73	58		
32	2736	2548	1848	1175	1115		
33							
34							
35							
36							
37	418			42			
38			47	58	49		
39				172	133		
40		440	391	380	286		
41			51	72	60		
42							
43		43	61	186	106		
44	324	409	379	677	281		
45			75	905	485		
46				99	68		
47							
48							
49					82		
50				144			
51				153	111		
52				123			
53							
54							
55							
56							
57							
58				48			
59			46	512	285		
60				50			
61			43	490	147		
62							
63				42			
64							
65							
66							
67							
68							
69				43			
70							
71				59			
72			117	3418	4197		
73			63	297	202		
74				1017	335		
75				48			
76				130	69		
77			55	472	234		
78				48			
79							
80				224	72		
81				144	41		
82							
83							
84							
85							
86							
87				253	81		
88				97			
89				446	91		
90							
91				65	75		
92							
93							
94							
95							
96			286	4453	1113		
97				245	67		
98							
99							
100							
101					41		
102				289			
103				41			
104				68			
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115				83			
116							
117							
118							
119				88			
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: Not Available
Cure: 8 hrs. at 366°K (93°C), 8 hrs. at 394°K (121°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% R.H.



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 45.5% of initial weight

$$k = 2.60 \times 10^{8} \exp\left(\frac{-35,800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	4.4×10^{15}	
373°K (100°C)	2.4×10^{12}	
423°K (150°C)	8.0×10^{9}	

Number and Relative Peak Intensity

	Temperature, °K (°C)				RTV-560		
m/e	573 (300)	673 (400)	773 (500)	923 (650)			
14	5307	5743	10505	5100			
15	2537	3779	19405	12712			
16	21653	21478	20700	13299			
17	53024	49001	35650	16677			
18	100993	101000	94094	44144			
19	240	259	304	111			
20	601	550	392	215			
21							
22							
23							
24		72	534	267			
25	155	53					
26	1356	2254	9534	4943			
27							
28	66240	66579	67345	35340			
29							
30	10837	10552	8165	3893			
31							
32	22520	22925	15881	7765			
33	43						
34	55	48					
35							
36			42				
37							
38							
39							
40	5500	5373	5144	2565			
41	1793	891	972	720			
42							
43							
44	6297	6149	5641	4495			
45	131						
46							
47			522	419			
48				78			
49							
50	524	2363	5859	544			
51	456	2366	5115	531			
52	295			399			
53	135	134					
54	46		46				
55	537	232	266	236			
56		191	231				
57	178	74	303				
58		110					
59		92	2632	2583			
60							
61	42	181	1862	1318			
62	40	377		213			
63	58		1069				
64	60						
65	65	150	417	315			
66	49	62					
67		45	114				
68			48	42			
69			47	62			
70							
71							
72							
73	58	738	18641	22562			
74	62	580	5353	4176			
75	46	463					
76							
77		7096		1254			
78	1064		18295				
79	54			161			
80		67					
81		98	1709	1368			
82		49					
83							
84		43					
85			300	294			
86		43					
87		91	2205	1786			
88			2841	2127			
89		151					
90							
91	53	99	1094	849			
92							
93			47	45			
94							
95							
96	240	1213	18211	14110			
97		56					
98							
99							
100							
101							
102							
103		243	4493	2952			
104		107					
105		68					
106							
107							
108			40				
109			57	47			
110							
111			293	233			
112							
113							
114							
115		101	2702	1842			
116		41					
117		60					
118							
119		245	4687	3177			
120							
121							
122							
123							
124							
125			1055	769			
126							
127							

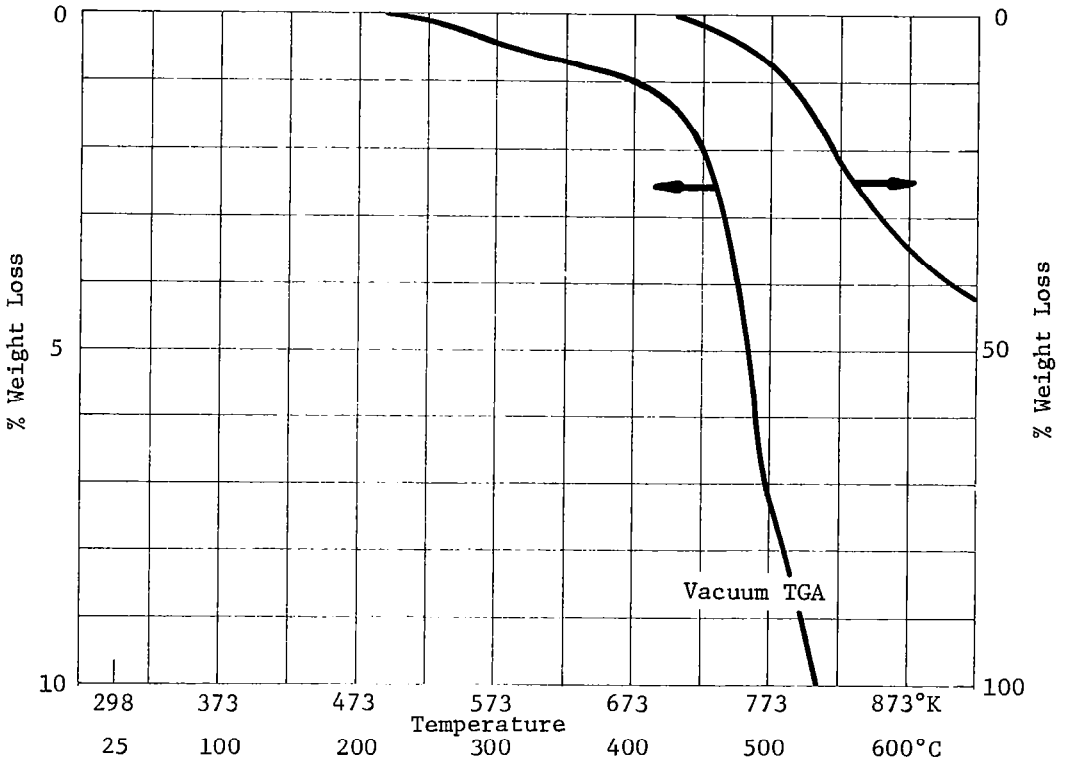
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 573 (300)	673 (400)	773 (500)	923 (650)	RTV-560		
128							
129	197	208					
130							
131	336						
132							
133	185	943	15716	10042			
134	91						
135	48	91					
136	43						
137							
138							
139							
140							
141							
142			63	41			
143			55				
144			84				
145							
146							
147		159	3965	3859			
148							
149		45					
150							
151			107				
152							
153							
154			190	292			
155							
156			40				
157							
158			51	59			
159							
160		41					
161							
162							
163		161					
164		49	3614	2477			
165		62					
166		58					
167			105				
168			73				
169							
170							
171							
172							
173							
174							
175							
176							
177		325					
178		80	6393	3618			
179		54					
180		44					
181			100				
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192	142	1062	15882	8837			
193	52	521					
194							
195		50					
196							
197							
198							
199							
200							
201							
202			96				
203							
204							
205							
206							
207							
208	1410	7208	100987	60210			
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220			56				
221							
222				423			
223			482				
224							
225			42	45			
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236			228	133			
237				98			
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 473°K (200°C) - 998°K (725°C)

a_o = 47.7% of initial weight

$$k = 2.82 \times 10^{6} \exp\left(\frac{-28,000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.1×10^{12}	
373°K (100°C)	6.0×10^{9}	
423°K (150°C)	6.8×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

RTV-566 A/B

m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	696	949	1121	2542	2972		
15	75	133	1047	6390	8759		
16	2094	1839	2245	4771	8088		
17	12246	9381	7894	7246	6349		
18	46413	37190	32666	27215	26368		
19	1058	1086	1071	887	687		
20	189	132	207	261	233		
21							
22							
23							
24				152	93		
25			91	1068	613		
26	108	127	1049	5875	3845		
27	290	286	720	2840	2306		
28	27074	27210	27172	32420	31084		
29	299	370	560	2108	1790		
30	170	117	166	296	328		
31	51	86	75	168	313		
32	7161	6959	6370	5226	5315		
33					41		
34							
35							
36			40	74	40		
37			60	316	65		
38			123	614	125		
39	44	59	644	1776	659		
40	571	533	627	939	788		
41	64	81	131	335	432		
42			96	198	369		
43	106	124	184	912	1658		
44	1071	1172	1607	1362	3891		
45		49	111	3866	3402		
46				125	108		
47				337	526		
48							
49			41	142	40		
50			708	1956	149		
51			817	2099	228		
52			710	1953	190		
53				72	104		
54							
55	50			68	141		
56					70		
57				79	104		
58				128	233		
59			72	2565	2101		
60				99	105		
61			68	1473	672		
62				83			
63			58	334	71		
64							
65				62	40		
66				61	109		
67					50		
68							
69							
70							
71				89	50		
72				144	95		
73			453	20159	16946		
74			115	2218	1362		
75			83	3088	2579		
76			59	325	65		
77			594	1684	296		
78			3422	7259	465		
79			98	411	110		
80							
81				857	701		
82				281	188		
83				46			
84							
85				121	71		
86							
87				842	313		
88				389	184		
89				1441	491		
90				77			
91				470	205		
92				52	43		
93							
94							
95				57			
96			316	9180	3758		
97				1631	445		
98							
99							
100							
101							
102				60			
103				1646	589		
104				189	63		
105				365	102		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116				410	136		
117							
118				146	44		
119				53			
120				781	230		
121							
122							
123							
124							
125							
126				55			
127							

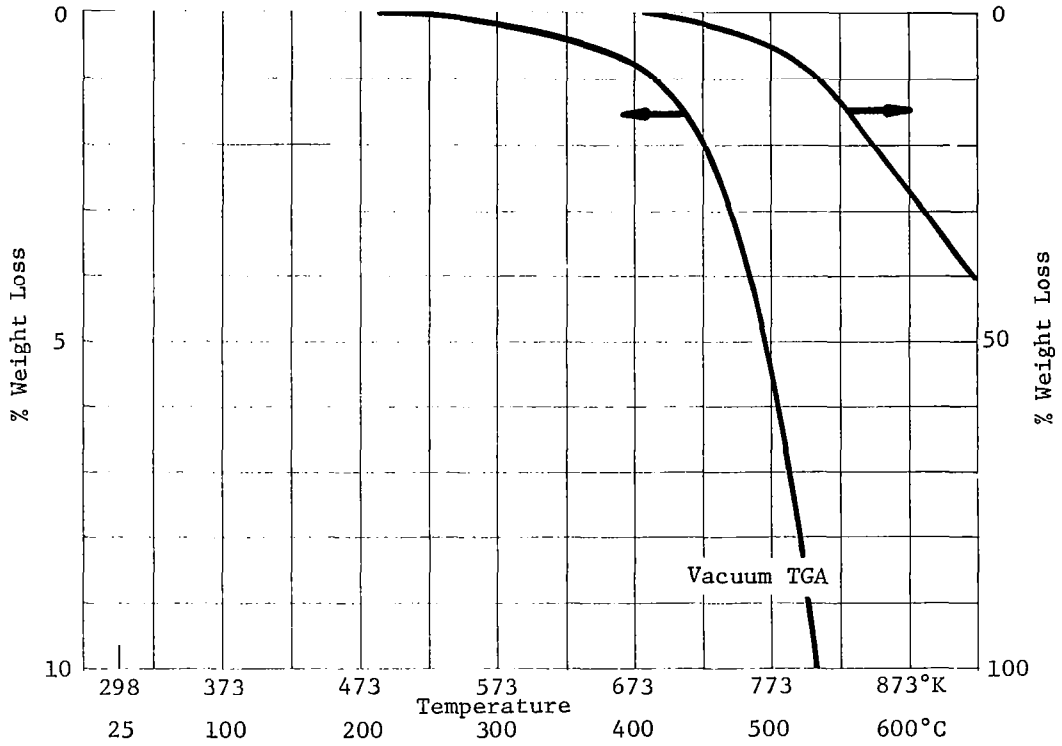
Number and Relative Peak Intensity (Continued)

	Temperature, °K (°C)					RTV-566 A/B	
m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
128							
129							
130							
131							
132							
133							
134				1681	559		
135				84			
136				50			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148				62	54		
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 0.1 pbw Accelerator
Cure: 7 days at room temperature

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) ~ 998°K (725°C)

a_o = 45.6% of initial weight

$$k = 9.84 \times 10^5 \exp\left(\frac{-26{,}900}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.2×10^{12}	
373°K (100°C)	4.2×10^{9}	
423°K (150°C)	5.6×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

RTV-566 A/B

m/e	623 (350)	723 (450)	823 (550)	923 (650)			
14	2742	4244	8037	7223			
15	934	5249	20498	16563			
16	8705	9249	12893	16424			
17	21599	16833	15257	16649			
18	63268	46811	39626	43641			
19	526	775	834	728			
20	409	371	362	422			
21							
22							
23							
24		53	366	217			
25		383	1498	936			
26	282	2302	7092	4656			
27	817	1875	5132	3750			
28	24213	28163	33349	31902			
29	374	1068	4002	2496			
30	2136	2187	2008	2056			
31		80	263	282			
32	6855	5941	5224	5458			
33							
34							
35							
36							
37		216	255	87			
38		365	392	194			
39	61	1044	1256	700			
40	3638	3741	3811	3827			
41	47	142	380	400			
42		87	304	353			
43	80	209	1081	1160			
44	1531	1829	2265	3482			
45		241	3660	2565			
46			170	116			
47			534	335			
48							
49		101	114				
50		1115	909	236			
51		1188	1011	281			
52		947	743	230			
53			44	78			
54							
55			71	115			
56							
57			73	99			
58			168	181			
59		120	2455	1790			
60			181	112			
61		105	1305	628			
62			74				
63		192	258	97			
64							
65			137	61			
66			72	107			
67							
68							
69							
70							
71			142	45			
72							
73		905	15948	11539			
74		230	1737	1071			
75		260	2806	1842			
76		108	241	90			
77		910	783	260			
78		4001	2754	597			
79		269	233				
80							
81			822	338			
82			400	134			
83							
84							
85			93				
86							
87			840	394			
88			461	183			
89		68	1401	616			
90			81				
91			573	299			
92			63	52			
93							
94							
95							
96		739	8162	3439			
97							
98							
99							
100							
101							
102			158	46			
103		84	1754	733			
104			345	92			
105			489	179			
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			745	265			
116			47				
117			333	113			
118			93				
119		54	1324	513			
120			69				
121							
122							
123							
124							
125			173				
126							
127							

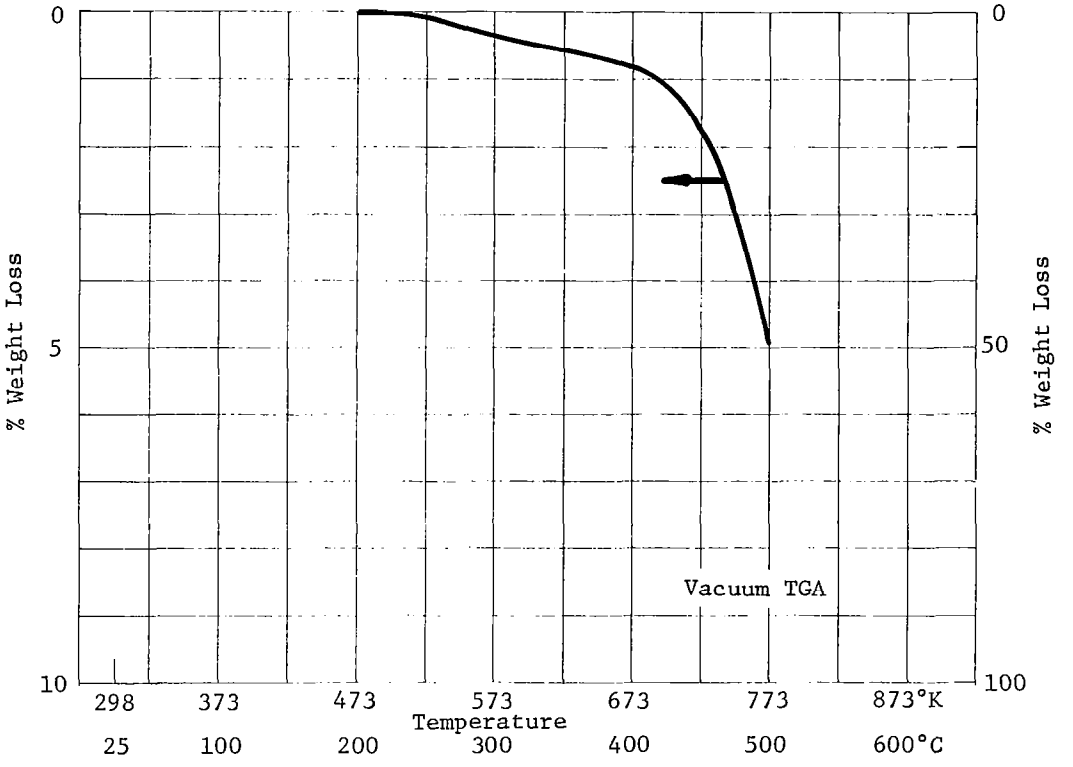
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)				RTV-566 A/B		
	623 (350)	723 (450)	823 (550)	923 (650)			
128							
129							
130							
131			79	43			
132			117	78			
133		228	3071	1180			
134			362	100			
135			204	41			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			419	272			
148							
149			47				
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163			94				
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			42				
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 100 pbw Resin to 0.1 pbw Accelerator
Cure: 48 hrs. at room temperature

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C)

RTV-566/SS4155 Primer

m/e	298 (25)	573 (300)	673 (400)	773 (500)			
14	1058	1041	1099	1934			
15	556	629	992	3942			
16	3428	3127	3281	4577			
17	12460	9030	8583	7875			
18	39929	27128	25213	22877			
19	159	157	182	201			
20	320	285	297	307			
21							
22							
23							
24			50	167			
25	61	69	145	542			
26	297	329	641	2429			
27	499	502	612	1382			
28	12310	11544	12361	15556			
29	225	301	362	983			
30	420	440	445	508			
31		116	104	161			
32	2997	2675	2624	2454			
33							
34							
35							
36				65			
37			85	225			
38		44	125	284			
39			295	777			
40	2468	2377	2441	2725			
41	84	98	152	207			
42	73	78	100	155			
43	93	114	172	373			
44	635	664	775	820			
45	40	54	114	1129			
46				95			
47				174			
48				42			
49			64	155			
50		78	294	783			
51	40	82	302	847			
52		60	254	754			
53				79			
54							
55			60	87			
56			41	54			
57			41	85			
58				104			
59			52	760			
60				99			
61			49	508			
62				80			
63			77	206			
64	45		56				
65		46		111			
66	60	62	70	103			
67			46	57			
68							
69							
70							
71				89			
72							
73			200	4898			
74			97	685			
75			86	930			
76			63	214			
77		67	235	656			
78	43	164	898	2552			
79			90	200			
80							
81			40	282			
82			43	188			
83				62			
84	86	92	86	107			
85				79			
86				58			
87				344			
88				208			
89			46	488			
90				70			
91			42	235			
92				65			
93							
94							
95							
96			178	2640			
97							
98							
99							
100							
101				41			
102				95			
103			54	631			
104				156			
105				206			
106				41			
107							
108							
109							
110							
111				48			
112							
113							
114							
115				290			
116				57			
117				160			
118				82			
119			42	472			
120				71			
121				75			
122							
123							
124							
125				95			
126				42			
127							

Number and Relative Peak Intensity (Continued)

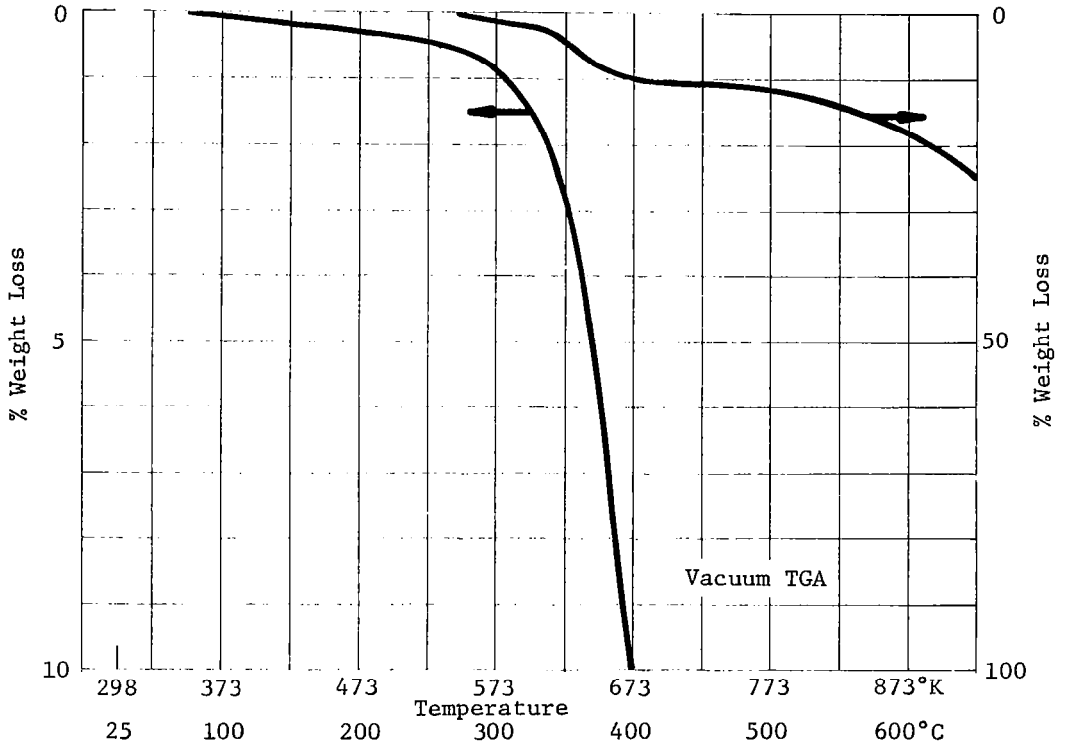
RTV-566/SS4155
Primer

m/e	Temperature, °K (°C) 298 (25)	573 (300)	673 (400)	773 (500)			
128							
129	94	94	92	127			
130							
131	72	70	77	118			
132	84	84	92	140			
133			69	1049			
134			45	186			
135				111			
136				44			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147				169			
148							
149				62			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				45			
162							
163				69			
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 99.5 pbw Resin (A) to 0.5 pbw Accelerator (B)
Cure: 48 hrs. at room temperature

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $523^{o}K$ ($250^{o}C$) - $723^{o}K$ ($450^{o}C$)

a_o = 9.56% of initial weight

$$k = 4.86 \times 10^{28} \exp\left(\frac{-84,100}{1.98\ T^{o}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	1.7×10^{28}	
$373^{o}K$ ($100^{o}C$)	3.6×10^{20}	
$423^{o}K$ ($150^{o}C$)	5.1×10^{14}	

Number and Relative Peak Intensity

Temperature, °K (°C) RTV-567 A/B

m/e	298 (25)	523 (250)	623 (350)	773 (500)	923 (650)		
14	3277	3064	10120	4491	10836		
15	1725	1766	24852	5411	30384		
16	10563	10047	17874	10983	25934		
17	37246	30451	28958	26781	26646		
18	100607	94161	86163	80697	78112		
19	432	428	463	433	362		
20	870	817	975	913	1015		
21							
22							
23							
24			930	166	837		
25	63	73	2985	730	2897		
26	628	771	13724	3682	13430		
27	1285	1361	7205	2485	8476		
28	40978	40606	65589	47131	66209		
29	706	720	5639	1341	5522		
30	1297	1409	1928	1415	1930		
31		128	558	157	777		
32	10029	9309	9112	8881	9101		
33							
34							
35							
36			95	66	127		
37			333	535	548		
38			445	732	794		
39			1505	1955	2833		
40	7476	7657	9445	8551	10437		
41	177	204	843	460	1694		
42	129	139	679	284	1136		
43	196	232	2072	463	2615		
44	2447	2532	2749	2036	3068		
45		43	5792	677	7316		
46			304		452		
47			1083	68	1148		
48			44		82		
49			159	337	239		
50		42	747	2258	1454		
51			729	2381	1616		
52			607	2137	1290		
53			136	95	322		
54			61		95		
55			321	78	496		
56			133	43	207		
57			302		390		
58			548		964		
59			3988	381	5510		
60			394		545		
61			3616	361	3405		
62			204	79	350		
63			287	423	650		
64		78	110				
65	62			135	470		
66	107	103	461	151	492		
67			162	41	209		
68			43		60		
69			68		107		
70			41		107		
71			454		488		
72			514	40			
73			12944	2593	27811		
74			2057	714	3368		
75			5882	693	6178		
76			502	419	635		
77			742	1845	1403		
78		50	1702	8360	3734		
79			145	550	354		
80			131				
81			2389	177	2081		
82			1393	124	1354		
83			264	41	352		
84	179	192	322	230	362		
85			348		417		
86			211	53	245		
87			2549	181	2428		
88			1513	71	1363		
89			3989	286	3851		
90			420		436		
91			348	179	1563		
92					681		
93					51		
94							
95							
96			23379	1866	20519		
97							
98			104		79		
99							
100							
101			167		162		
102			742		626		
103			4681	404	4444		
104			1068	61	1023		
105			1454	106	1420		
106			138		171		
107			140		134		
108							
109							
110			64		70		
111			143		147		
112			59		70		
113					62		
114							
115			2315	146	2227		
116			314		420		
117			1078	44	1123		
118			385		422		
119			3769	305	3632		
120			412		406		
121			438		404		
122							
123							
124							
125			382		398		
126			65		101		
127							

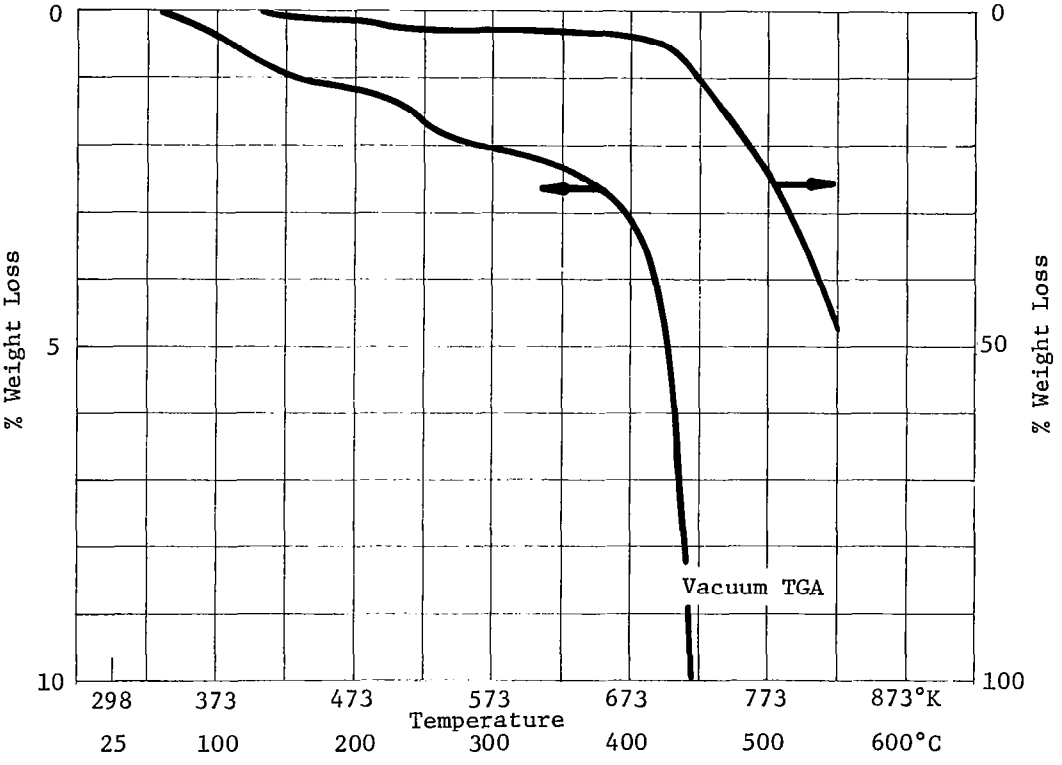
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C)				RTV-567 A/B		
	298 (25)	523 (250)	623 (350)	773 (500)	923 (650)		
128							
129	212	225	373	245	448		
130							
131	156	137	505	194	577		
132	163	191	711	286	709		
133			8690	653	8195		
134	42	42	1245	142	1172		
135			691		708		
136			95		113		
137							
138							
139							
140							
141							
142							
143							
144							
145			54		64		
146			62		49		
147			1142	60	1314		
148			151		189		
149			332		345		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			237		254		
162					50		
163			423		520		
164					45		
165			157		226		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			271		311		
178							
179					41		
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191			111		195		
192							
193					109		
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207					212		
208			124		173		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 97 pbw Resin to 3 pbw Catalyst
Cure: 57 hrs. at 396°K (123°C) in nitrogen

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)	823 (550)	RTV-8111 Silicone Elastomer	
14	379	375	386	911	1497		
15	48	61	165	2996	6796		
16	986	855	951	1748	2550		
17	2995	2480	2370	2592	2636		
18	9369	7494	6904	7483	6777		
19	182	176	244	403	360		
20	59	61	53	85	96		
21							
22							
23							
24					81		
25				173	455		
26				1113	2606		
27	63	66	137	1251	2746		
28	3801	3744	3916	7393	10392		
29			101	1464	3036		
30	272	265	252	432	555		
31			43	148	184		
32	880	890	925	1035	1103		
33							
34							
35							
36							
37							
38					58		
39				87	277		
40	461	433	473	676	867		
41				77	175		
42				74	160		
43				338	998		
44	131	177	226	410	664		
45			44	1200	4263		
46				49	210		
47				167	606		
48							
49							
50							
51					51		
52					45		
53					43		
54							
55					76		
56							
57					131		
58				76	266		
59				847	3097		
60				67	252		
61				554	1358		
62					57		
63				40	62		
64							
65							
66					62		
67							
68							
69							
70							
71				58	232		
72				83			
73			85	4374	29236		
74				488	2702		
75				1195	3377		
76				62	193		
77				67	242		
78					43		
79					203		
80					61		
81				403	1098		
82				231	507		
83					88		
84							
85				55	225		
86					68		
87				448	1178		
88				289	660		
89				776	1795		
90				79	166		
91				50	124		
92							
93							
94							
95							
96			228	5455	11477		
97							
98				66	44		
99							
100							
101				46	99		
102				153	348		
103				1191	2534		
104				233	645		
105				360	750		
106					71		
107					82		
108							
109							
110					55		
111					92		
112					45		
113					42		
114							
115				616	1438		
116				68	197		
117				303	818		
118				102	260		
119				1082	2388		
120				113	263		
121				101	276		
122							
123							
124							
125				84	297		
126					77		
127							

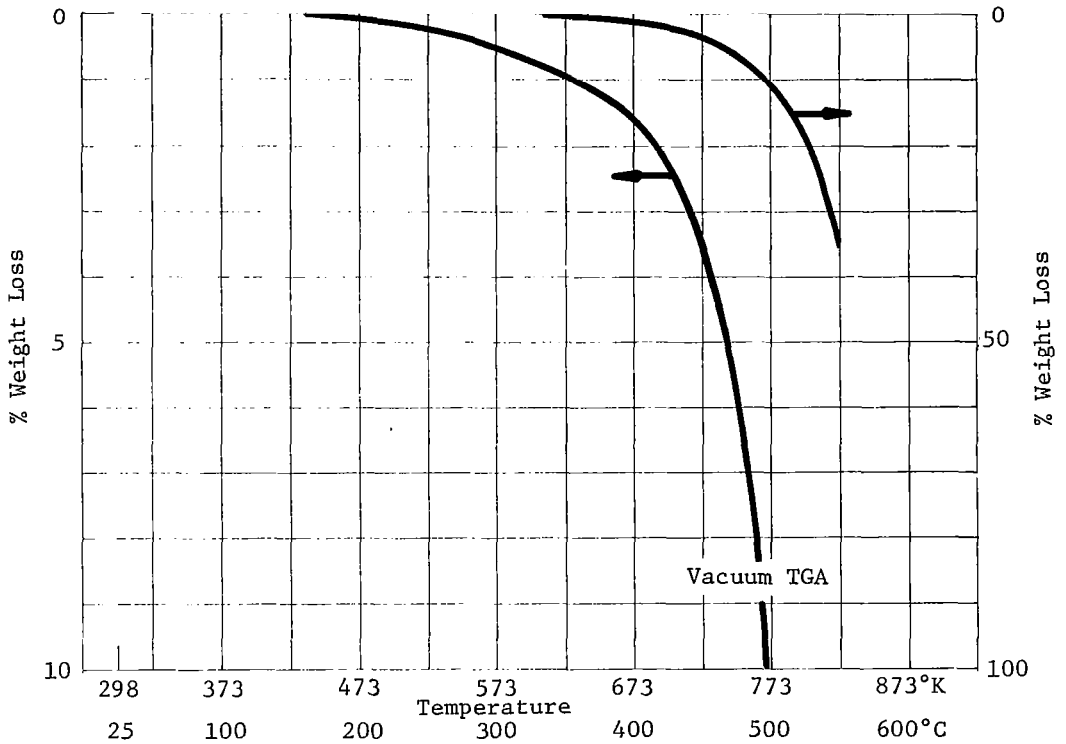
Number and Relative Peak Intensity (Continued)

RTV-8111 Silicone Elastomer

m/e	Temperature, °K (°C) 298 (25)	523 (250)	623 (350)	723 (450)	823 (550)		
128							
129							
130					45		
131							
132				91	304		
133				154	349		
134			110	3149	6710		
135				392	911		
136				246	570		
137							
138							
139							
140							
141							
142							
143							
144							
145							
146					80		
147				42	88		
148				685	2405		
149				92	364		
150				181	551		
151					43		
152					41		
153							
154							
155							
156					46		
157							
158							
159							
160					53		
161							
162				242	520		
163				65	147		
164				466	988		
165				55	132		
166				164	384		
167					41		
168							
169							
170							
171							
172							
173							
174							
175							
176					51		
177				120	224		
178				747	1374		
179				130	267		
180				138	315		
181							
182							
183							
184							
185							
186							
187							
188							
189							
190				41	101		
191					50		
192				1379	2423		
193				227	451		
194				592	1233		
195				81	192		
196				40	96		
197							
198							
199							
200							
201							
202							
203							
204							
205							
206					63		
207							
208			445	9511	15616		
209			71	1874	3107		
210				1105	1806		
211				109	225		
212					43		
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 97 pbw Resin to 3 pbw Catalyst
Cure: 2 hrs. at room temperature, 2 hrs. at 339°K (66°C), 24 hrs. at 412°K (139°C) under a vacuum of 1 x 10^{-5} Torr
1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: *Not amenable to analysis*

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

RTV-8111 Silicone Elastomer

m/e	Temperature, °K (°C) 298 (25)	473 (200)	573 (300)	723 (450)	823 (550)		
14	515	489	393	776	1894		
15	58	56	61	1611	9161		
16	1179	911	908	1376	2715		
17	3295	2561	2292	2085	2235		
18	11115	7866	6691	6036	5867		
19	1098	1134	1193	1195	734		
20	65	47	59	60	84		
21							
22							
23							
24					155		
25				104	499		
26	48		55	527	2735		
27	109	108	115	627	3438		
28	4721	4403	3831	5103	10431		
29	52	52	69	648	4162		
30	302	277	269	289	593		
31				103	241		
32	1221	1015	987	913	1022		
33							
34							
35							
36							
37							
38					67		
39				62	275		
40	510	497	424	540	887		
41					181		
42					209		
43				132	1227		
44	227	238	263	321	700		
45				452	5350		
46					290		
47				41	651		
48							
49							
50							
51					45		
52					48		
53					42		
54							
55					127		
56							
57					235		
58					359		
59				302	4078		
60					320		
61				183	1838		
62					103		
63					77		
64							
65					55		
66					92		
67					41		
68							
69							
70					42		
71					307		
72							
73				1898	37462		
74				188	3636		
75				362	4669		
76					256		
77					247		
78							
79					94		
80					85		
81				127	1135		
82				55	637		
83					111		
84							
85					310		
86					88		
87				148	1612		
88				96	857		
89				246	2424		
90					243		
91					164		
92							
93							
94							
95							
96				1868	15373		
97							
98					47		
99							
100							
101					158		
102				59	504		
103				357	3718		
104				87	825		
105				86	1053		
106					110		
107					113		
108							
109							
110					59		
111					123		
112					58		
113					49		
114							
115				188	1900		
116				81	287		
117					1101		
118					436		
119				350	3438		
120					377		
121					372		
122							
123							
124							
125					458		
126					117		
127							

Number and Relative Peak Intensity (Continued)

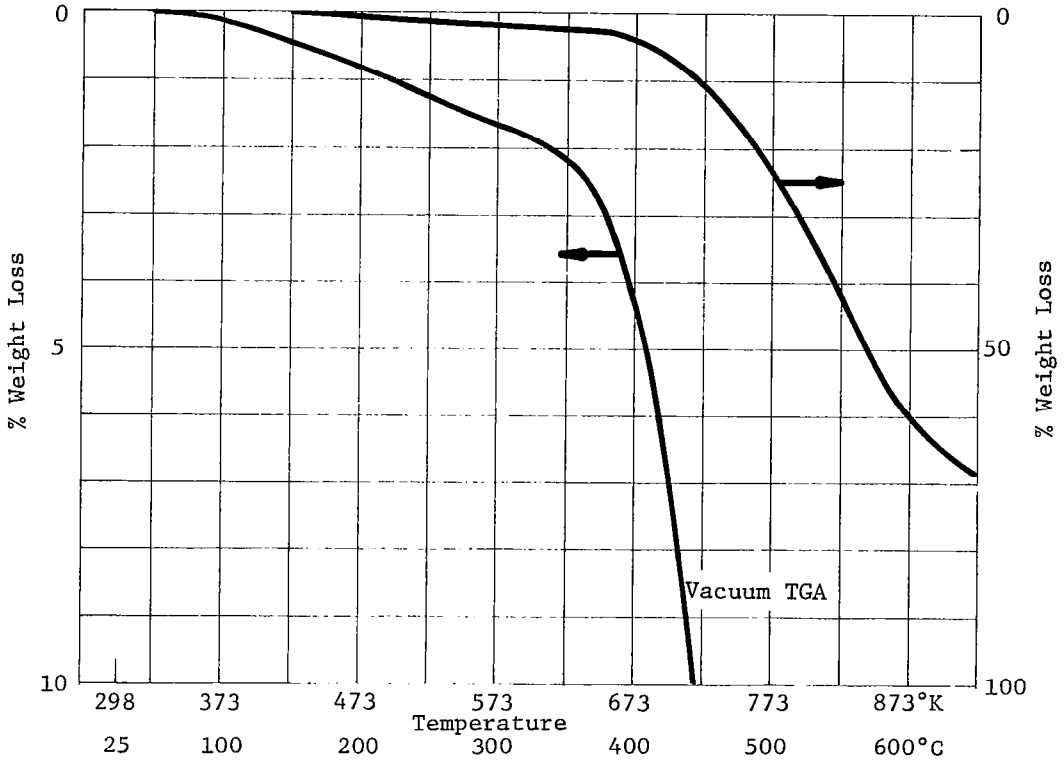
RTV-8111 Silicone Elastomer

m/e	Temperature, °K (°C) 298 (25)	473 (200)	573 (300)	723 (450)	823 (550)		
128							
129					78		
130							
131					424		
132				49	507		
133				1100	9492		
134				133	1337		
135				79	810		
136					60		
137							
138							
139							
140							
141							
142							
143							
144							
145					129		
146					127		
147				200	3249		
148					515		
149				50	686		
150					72		
151					44		
152							
153							
154					53		
155					46		
156							
157							
158							
159					71		
160							
161				77	730		
162					236		
163				146	1477		
164					230		
165				56	600		
166					70		
167					44		
168							
169							
170							
171							
172							
173							
174					42		
175					71		
176					357		
177				258	1969		
178				40	400		
179				40	521		
180					60		
181					48		
182							
183							
184							
185							
186							
187							
188							
189					164		
190					69		
191				461	3708		
192				74	757		
193				224	1862		
194					303		
195					169		
196							
197							
198							
199							
200							
201							
202							
203					66		
204							
205					101		
206					54		
207				3360	22549		
208				653	4499		
209				347	2699		
210					323		
211					94		
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 97 pbw Resin to 3 pbw Catalyst
Cure: 2 hrs. at room temperature, 2 hrs. at 339°K (66°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 823°K (550°C)

a_o = 19.7% of initial weight

$$k = 7.34 \times 10^{12} \exp\left(\frac{-41,000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	5.4×10^{14}	
373°K (100°C)	1.0×10^{10}	
423°K (150°C)	1.4×10^{8}	

Number and Relative Peak Intensity

RTV-8111 Silicone Elastomer

Temperature, °K (°C)

m/e	298 (25)	673 (400)	773 (500)	873 (600)	973 (700)		
14	2272	4044	615	4059	2716		
15	377	9943	2820	9729	2254		
16	6431	7198	1072	6051	4675		
17	18914	13250	1122	8218	7210		
18	54948	38668	3468	21092	17862		
19	68	123		116	259		
20	129	162		70	71		
21							
22							
23							
24		138		77			
25		565	43	379	61		
26	185	3030	615	2012	550		
27		3402	841	3079	935		
28	19119	28903	3750	19097	13483		
29	241	3284	1020	3277	575		
30	1890	2376	181	1500	1131		
31	53			3583	47		
32	6389	6371	517		3035		
33							
34							
35							
36							
37		58		43			
38		106		46			
39							
40	2139	2763	234	1784	1437		
41		690		383	230		
42					66		
43	49		223	1027			
44	1183	2340		3135	1872		
45		2215	802		248		
46				158			
47		367	66	354			
48							
49		42					
50		95		68			
51		135		68			
52		84		45			
53		73		47			
54							
55		284		155	45		
56		290		175	48		
57		399		315	45		
58							
59		1773	683	2566	109		
60				213			
61		1583	513	1107	43		
62		96		50			
63		114		54			
64							
65				70			
66		123		57			
67		65					
68		47					
69		77		44			
70							
71		342		281			
72							
73		5550	3354	24101	1531		
74				2893	146		
75		2875	985	2831	174		
76		254		183			
77		295		189			
78		254		107			
79							
80							
81		1276	362	654			
82		809	183	354			
83				73			
84							
85		192		192			
86							
87		1733	539	951			
88					43		
89		2324	703	1233	53		
90		290		145			
91		249		136			
92							
93							
94							
95							
96		15550	5285	7119	469		
97							
98							
99							
100							
101				167			
102							
103		3404	1114	2132	145		
104		1058	293	658			
105		1034	265	596			
106		128		52			
107		78					
108							
109							
110		56		44			
111		101		53			
112				40			
113							
114							
115		2060		1231	46		
116				676			
117		1070	283				
118					47		
119		3597	1131	2011	111		
120		537	107	270			
121		388	54	194			
122							
123							
124				67			
125		264		228			
126		63		58			
127							

Number and Relative Peak Intensity (Continued)

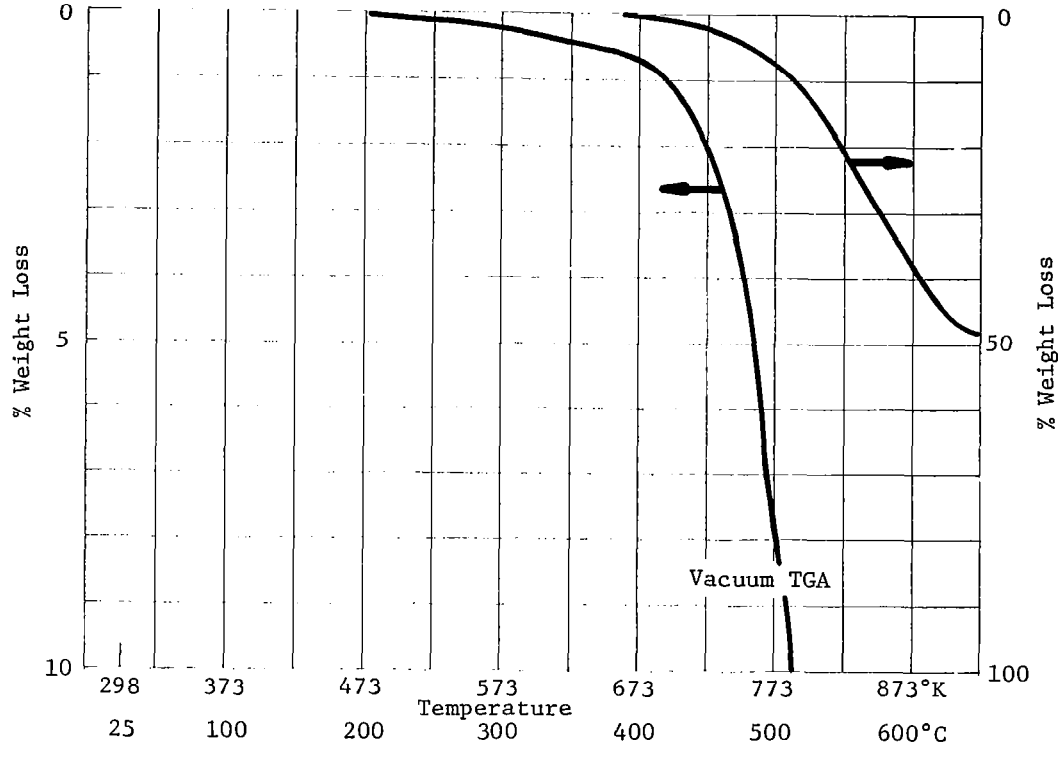
RTV-8111 Silicone Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	973 (700)		
128							
129		94		44			
130							
131			115	386			
132							
133		11142	3554	6174	444		
134		1818	539	1042	52		
135		970	257	548			
136		65					
137							
138							
139							
140							
141							
142							
143		43					
144		61					
145				89			
146							
147		2448	788	2629	150		
148			171	597			
149		778	203	554			
150		87		44			
151		43					
152							
153							
154				46			
155							
156							
157							
158		48					
159		105					
160							
161		1274	319	642			
162							
163		2365	697	1293	51		
164							
165		972	238	513			
166		132		63			
167		47					
168							
169							
170							
171							
172							
173							
174		51					
175							
176							
177		3915	1169	2160	119		
178		1102	292	721			
179		860	204				
180		98		77			
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191		9731	2777	5229	359		
192							
193		4237	1246	3146	175		
194							
195				272			
196							
197							
198							
199							
200							
201							
202		51					
203		97		68			
204		51		60			
205							
206							
207		76016	22152	37687	3307		
208							
209							
210							
211		293		116			
212							
213							
214							
215							
216							
217							
218							
219							
220							
221				83			
222		179		56			
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235				47			
236							
237				58			
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: 47 pbw 82621 to 47 pbw 83831 to 6 pbw 9858
Cure: 4 hrs. at room temperature, 4 hrs. at 339°K (66°C),
24 hrs. at 411°K (138°C) at 1 x 10^{-5} Torr

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 473°K (200°C) - 923°K (650°C)

a_o = 48.9% of initial weight

$$k = 9.09 \times 10^6 \exp\left(\frac{-29,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	9.2×10^{12}	
373°K (100°C)	1.8×10^{10}	
423°K (150°C)	1.6×10^{8}	

Number and Relative Peak Intensity

Temperature, °K (°C)

RTV-82621, RTV-83831
Cat. 9858

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	2344	3844	9323	9928	5429		
15	1136	5638	25042	27081	9938		
16	6334	7588	14098	17022	11066		
17	19276	16681	15612	15735	15622		
18	62755	53175	48101	48644	48755		
19	849	954	792	493	576		
20	557	558	635	643	570		
21							
22							
23	66						
24		118	648	704	195		
25	50	485	2274	2361	736		
26	462	2529	10154	10455	3437		
27	735	1988	6506	7012	2667		
28	30673	34528	48157	48893	35220		
29	546	1587	5401	5255	1598		
30	602	799	1074	1080	795		
31	192	615	1191	985	486		
32	6677	5842	5244	5381	5392		
33							
34					46		
35							
36			65	82	40		
37		40	139	165	71		
38		86	221	264	122		
39	166	502	926	1102	511		
40	4988	4985	5857	6076	5046		
41	109	555	805	819	417		
42	83	343	635	690	343		
43	121	607	1869	1885	683		
44	3365	3526	3559	3746	3384		
45	81	655	5797	6232	1307		
46		80	416	435	87		
47		62	936	962	147		
48				65	106		
49			45	48			
50		83	117	156	93		
51		68	176	195	99		
52		42	141	149	48		
53			86	155	84		
54				87	48		
55		96	235	254	103		
56		108	109	103	55		
57		50	259	283	71		
58		41	484	485	103		
59		240	3740	3978	753		
60			368	418	72		
61		249	3059	2881	254		
62			164	162			
63			151	169			
64		51		96	154		
65	51	61	71				
66	70	90	311	364	131		
67		50	121	158	47		
68							
69			53	55			
70			41				
71			396	389	40		
72			483	473	51		
73		692	15211	21071	5044		
74		105	2075	2632	449		
75		381	5043	5180	759		
76			354	343	44		
77		53	319	337	73		
78		67	151	146	95		
79			68	66			
80			103				
81		148	1885	1739	136		
82		112	1146	1060	92		
83			181	188			
84	136	154	208	208	152		
85			272	287			
86			159	153	40		
87		133	2070	1965	153		
88		81	1222	1081	72		
89		249	3245	3033	233		
90			323	302			
91		49	271	247	54		
92							
93							
94							
95							
96		1701	19270	16968	1481		
97		305			145		
98			246	65			
99							
100							
101			128	131			
102			523	455			
103		305	3727	3199	254		
104			777	665			
105		63	1062	915	79		
106			91	69			
107			99	75			
108							
109							
110							
111			88	74			
112							
113							
114							
115		90	1671	1463	92		
116			212	208			
117		49	764	716	41		
118			239	201			
119		167	2791	2395	166		
120			278	229			
121			282	236			
122							
123							
124							
125			191	183			
126							
127							

Number and Relative Peak Intensity (Continued)

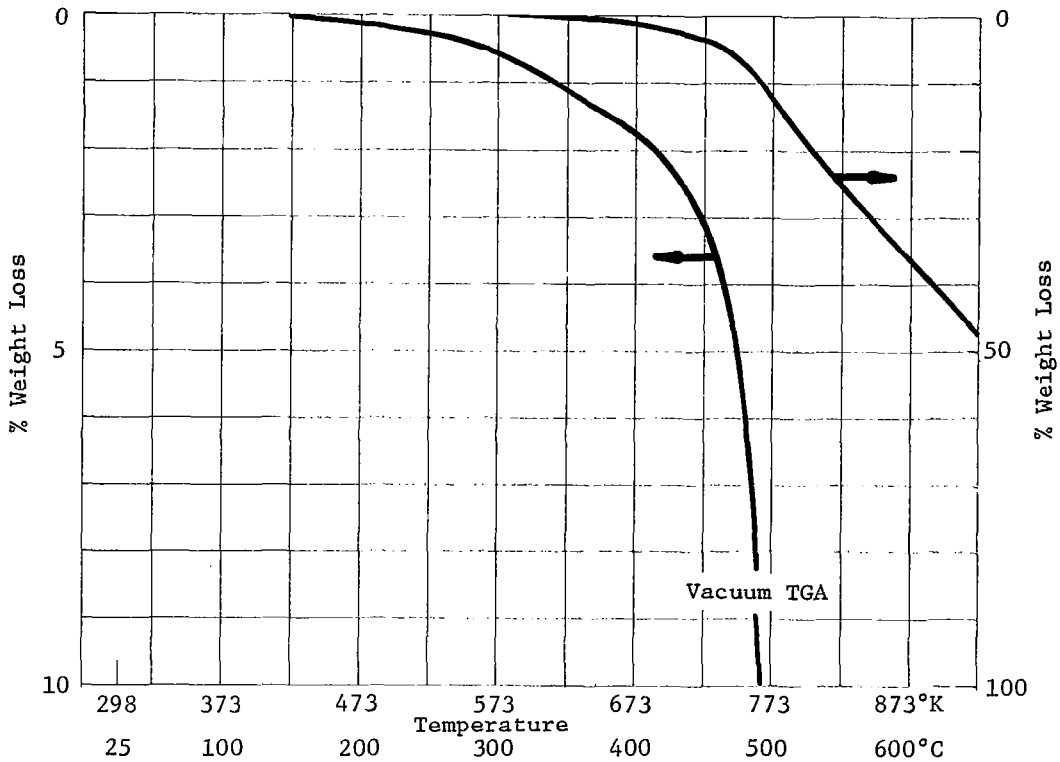
RTV-82621, RTV-83831
Cat. 9858

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	113	128	205	213	114		
130							
131	67	89	280	258	84		
132	110	115	403	375	134		
133		388	5196	4273	372		
134		60	670	598	57		
135			387	333			
136			40	50			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			576	559	42		
148			41	65			
149			125	114			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				57			
162			67				
163							
164			111	112			
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			52	54			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208			46				
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 1023°K (750°C)

a_o = 54.3% of initial weight

$$k = 4.78 \times 10^4 \exp\left(\frac{-21{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.6×10^9	
373°K (100°C)	5.1×10^7	
423°K (150°C)	1.6×10^6	

Isothermal weight loss in nitrogen = 0.26%

Number and Relative Peak Intensity

Temperature, °K (°C) — S-383-70 Elastomer

m/e	298 (25)	673 (400)	773 (500)	873 (600)	934 (661)		
14	2090	2731	5283	6007	5373		
15	816	3329	12605	15093	12715		
16	4651	5450	9364	10478	10951		
17	16904	13685	12605	11808	11292		
18	56487	44019	38598	37053	35469		
19	2251	2077	1821	1523	1403		
20	657	634	750	741	731		
21							
22							
23							
24		87	466	499	264		
25	52	434	1681	1786	1090		
26	481	2133	7959	8305	5101		
27	617	1226	3808	4305	2958		
28	26667	28533	38466	39209	34176		
29	365	968	2909	3187	2054		
30	363	438	644	686	569		
31	134	283	499	515	343		
32	5926	5177	5014	5016	5017		
33							
34							
35							
36			63	70	48		
37		56	256	258	94		
38		92	384	417	192		
39		395	1368	1394	710		
40	2803	2976	3672	3773	3466		
41	71	227	545	523	388		
42	55	157	396	400	337		
43	95	387	1298	1409	982		
44	833	871	1077	1133	1004		
45	44	708	4353	5027	2863		
46		52	236	307	144		
47		80	639	890	683		
48				44			
49			129	176	78		
50	54	192	889	811	244		
51	40	227	1139	1081	357		
52		149	710	680	192		
53			153	161	114		
54			43	45			
55		60	171	167	101		
56			50				
57			175	198	121		
58			266	338	307		
59		374	2779	3457	2178		
60			250	314	165		
61		238	1728	1830	1032		
62			129	140	58		
63			294	351	184		
64	60	40		781	54		
65		61	416	477	160		
66	42	72	240	279	200		
67			98	115	83		
68							
69				47			
70							
71			223	261	121		
72							
73		2039	19142	25805	12388		
74		217	2137	2701	1303		
75		515	3644	3933	2089		
76		47	368	332	151		
77		209	1084	1128	510		
78	89	606	2304	2153	660		
79		49	267		218		
80			73		68		
81		161	1151	1728	1266		
82		98	608	745	394		
83			143	168	104		
84	80	101	165	166	143		
85			242	300	145		
86			85	110	56		
87		142	1207	1329	690		
88		65	683	725	367		
89			1915	2118	1101		
90			202	214	101		
91		144	1830	1781	492		
92			257	402			
93				50			
94							
95							
96		1819	10230	10939	5862		
97		181					
98				42	50		
99							
100							
101			104	85			
102			318	356	150		
103		352	2350	2429	1218		
104		45	551	587	261		
105		108	847	899	421		
106			74	75			
107			93	111	41		
108							
109							
110			48				
111			92				
112			50	46			
113							
114							
115		144	1052	1159	528		
116			129	152	84		
117		45	537	606	272		
118			205	220	88		
119		277	1954	1962	1000		
120			227	260	95		
121			247	254	119		
122							
123							
124							
125			273	249	95		
126			71	93	55		
127			618	297			

Number and Relative Peak Intensity (Continued)

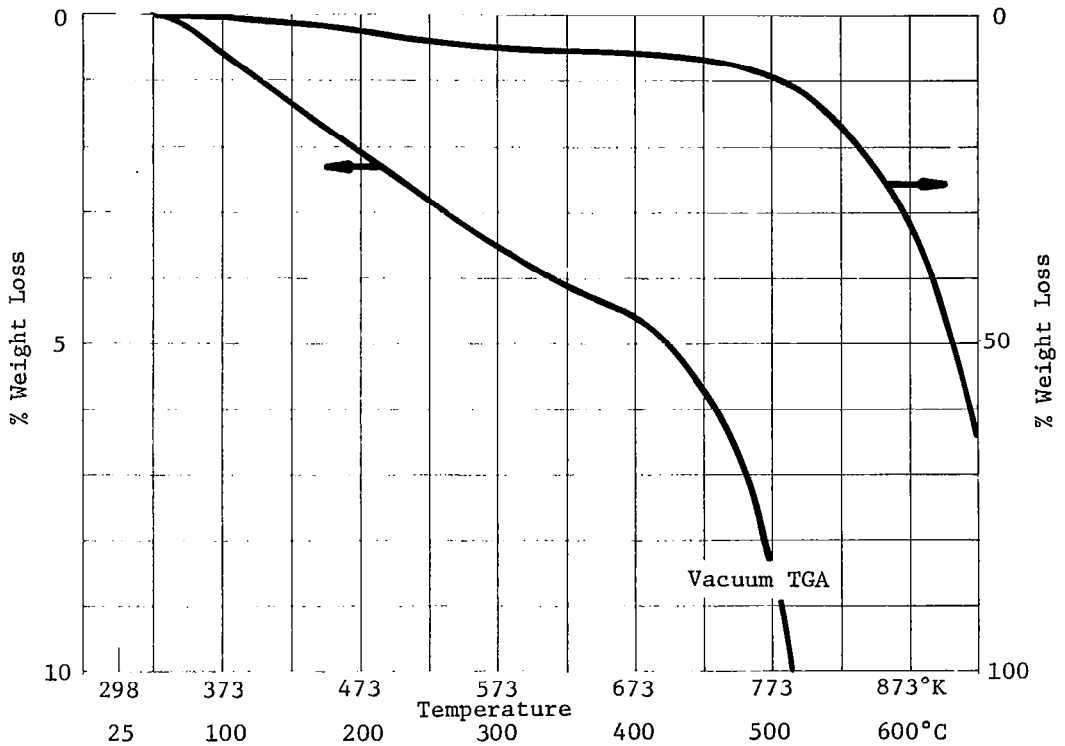
S-383-70 Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	934 (661)		
128			113	48			
129	97	106	188	224	139		
130							
131	82	100	282	301	201		
132	94	119	367	388	226		
133		712	4525	4467	2221		
134		106	652	647	296		
135			768	891	313		
136			71	94			
137							
138							
139							
140							
141							
142							
143							
144							
145				58			
146							
147		51	818	995	396		
148'			83	138	50		
149			203	216	78		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			143	138	57		
162							
163			317	328	110		
164			45				
165			106	93			
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			202	233	56		
178							
179				43			
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191			165	150	46		
192							
193			68	87			
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207			216	206	42		
208			226		60		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 69.8% of initial weight

$$k = 2.27 \times 10^{5} \exp\left(\frac{-25,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	7.1×10^{11}	
373°K (100°C)	3.3×10^{9}	
423°K (150°C)	5.4×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

S-469-40 Elastomer

m/e	298 (25)	523 (250)	673 (400)	823 (550)			
14	5896	5800	7117	14828			
15	3485	3349	7805	36669			
16	25879	24458	24337	25732			
17	69307	60375	53956	36924			
18	101098	101166	101187	95227			
19	291	309	344	407			
20	779	694	608	424			
21							
22							
23							
24			87	774			
25	60	108	536				
26	845	1038	3132	14005			
27							
28	77601	74955	75641	80120			
29				8871			
30	13865	13637	13039	8996			
31							
32	30031	28108	25319	16899			
33	45	45					
34	72	59	45				
35							
36			62				
37		41					
38		61					
39							
40	6823	6869	6665	5744			
41	353	463	935	1808			
42							
43							
44	7422	7366	7036				
45	79	94		9322			
46			79				
47			51	1284			
48				140			
49							
50	89	145	544	1029			
51	91	140	529	989			
52	48	63	355	795			
53		40	109	372			
54	40	53					
55	53	90	232	557			
56		50	165				
57			94				
58			257				
59				8033			
60							
61			279	4938			
62			101	635			
63			94				
64	45	67					
65	54	49	168	786			
66	41		114				
67			98				
68			62	141			
69			43	190			
70			58				
71			58				
72							
73			1033	78322			
74			658	14480			
75							
76	50			1572			
77	117	192	1254	2456			
78	98	170					
79			120				
80							
81			345	4815			
82			190				
83			76				
84		42	52				
85			47	954			
86							
87			387	6406			
88			555				
89				7397			
90							
91		45	198				
92			44	247			
93				70			
94			46				
95							
96		67	3475	50705			
97							
98							
99				101			
100							
101							
102							
103			768	11314			
104			301				
105							
106			46				
107							
108							
109				237			
110							
111				714			
112							
113							
114							
115			423	6818			
116							
117							
118							
119			772	11886			
120			107				
121							
122							
123							
124							
125			40				
126				2283			
127							

Number and Relative Peak Intensity (Continued)

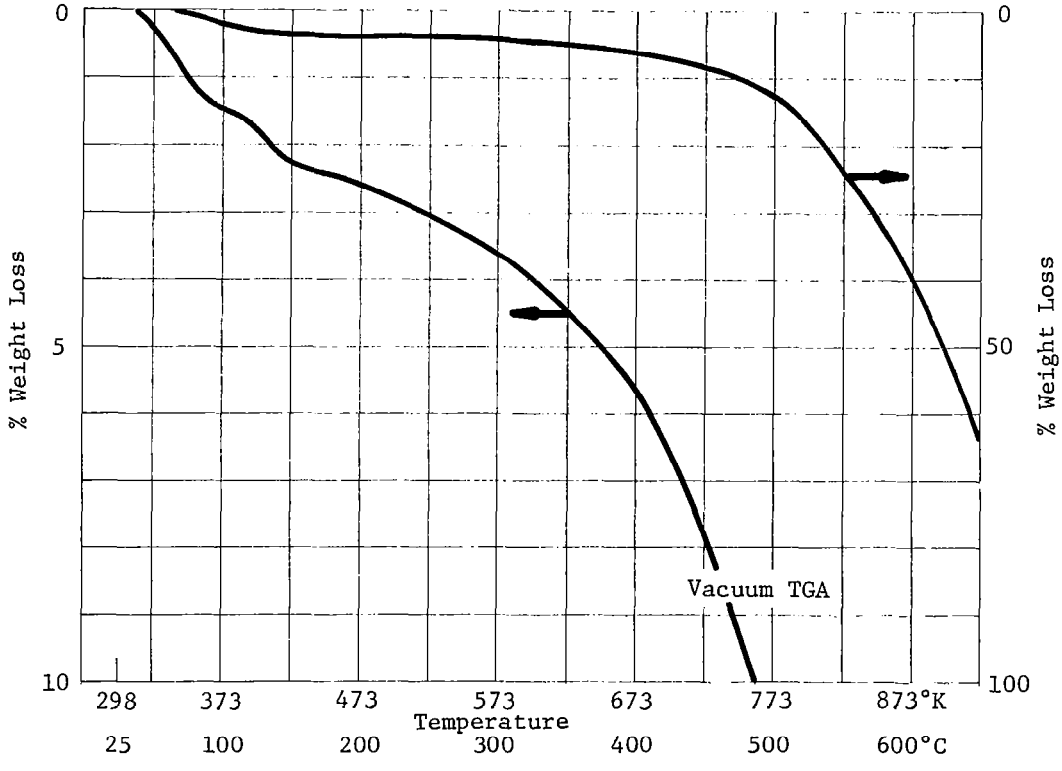
S-469-40 Elastomer

m/e	Temperature, °K (°C) 298 (25)	523 (250)	673 (400)	823 (550)			
128							
129	252	244	263				
130							
131	356	374					
132							
133		81	2510	37860			
134	50	43					
135							
136	40	45	226				
137				81			
138							
139							
140							
141				43			
142							
143							
144							
145			49				
146							
147			542	12834			
148							
149			180				
150							
151							
152							
153							
154							
155				514			
156							
157				50			
158							
159							
160			96				
161							
162							
163			509				
164				8853			
165			205				
166							
167							
168							
169				40			
170				77			
171				146			
172							
173							
174							
175			52				
176							
177							
178			1029	14373			
179			288				
180			180				
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192			2968	35256			
193							
194							
195							
196			40				
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207				101209			
208		435	19019				
209		56					
210							
211							
212							
213							
214							
215							
216							
217							
218				45			
219				62			
220				200			
221							
222							
223				1044			
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234				136			
235				165			
236				551			
237							
238							
239				94			
240				40			

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) – 1023°K (750°C)

a_o = 69.0% of initial weight

$$k = 2.42 \times 10^{4} \exp\left(\frac{-21,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.4×10^{10}	
373°K (100°C)	1.5×10^{8}	
423°K (150°C)	4.5×10^{6}	

Condensible degassing = 4.2×10^{-4}%/day

Isothermal weight loss in nitrogen = 0.99%

Number and Relative Peak Intensity

Temperature, °K (°C)

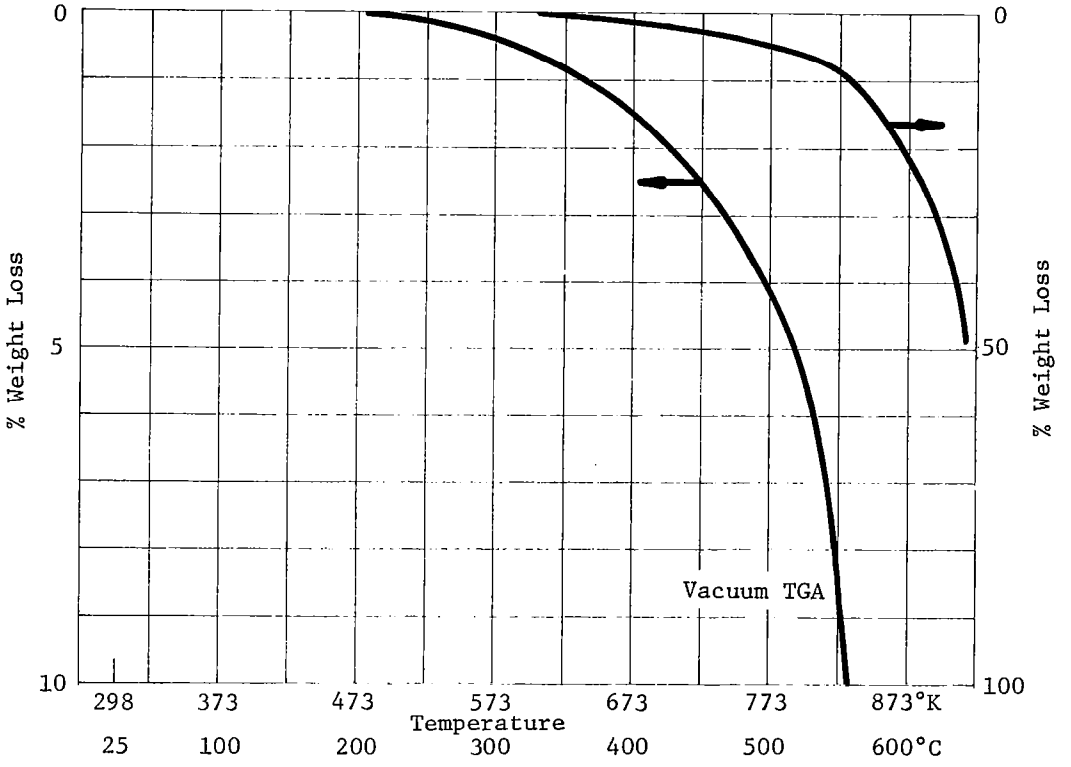
S-469-40 Elastomer

m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	1744	1654	2296	3826	5863		
15	270	374	2806	8229	14510		
16	2696	2377	3129	5151	8228		
17	11748	8812	7093	6565	6488		
18	40327	29514	23224	21442	20372		
19	125	130	176	189	191		
20	215	185	172	177	249		
21							
22							
23							
24			53	188	251		
25			232	730	1092		
26	116	208	1355	3658	5010		
27							
28	18017	16965	19654	25038	28505		
29	290	404	910	1960	2648		
30	248	257	291	409	500		
31		255		257	372		
32	4495	4056	3606	3488	3464		
33							
34							
35							
36							
37				50	52		
38			46	69	93		
39		45		397	450		
40	1227	1170	1319	1519	1811		
41		41	234	269	289		
42			118	190	240		
43	47	69	284	606	1022		
44	286	333	403	583	867		
45			437	2140	3921		
46				69	177		
47			58	260	487		
48							
49							
50			57	70	52		
51			57	98	68		
52			46	63	56		
53					56		
54							
55			54	63	83		
56							
57				58	96		
58				88	214		
59			209	1244	2313		
60				72	138		
61			185	755	1032		
62					40		
63					57		
64							
65				41	58		
66				58	86		
67							
68							
69							
70							
71				70	96		
72							
73			785	7313	16916		
74			79	717	1608		
75			310	1312	2004		
76				51	86		
77			43	83	91		
78			106	157	56		
79					184		
80							
81			49	307	425		
82			47	171	262		
83							
84				50	63		
85				45	75		
86							
87			64	379	517		
88				159	223		
89			129	569	731		
90				40	46		
91				45	54		
92							
93							
94							
95							
96			841	3128	3871		
97			41		396		
98							
99							
100							
101							
102				52	50		
103			107	578	730		
104				97	104		
105				109	135		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115				185	96		
116							
117				60	75		
118							
119				261	319		
120							
121							
122							
123							
124							
125							
126							
127							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received, post cured 24 hrs. at 477°K (204°C) in air

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 473°K (200°C) - 1023°K (750°C)

a_o = 72.9% of initial weight

$$k = 2.18 \times 10^3 \exp\left(\frac{-18,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	9.7×10^8	
373°K (100°C)	2.0×10^7	
423°K (150°C)	1.0×10^6	

Number and Relative Peak Intensity

Temperature, °K (°C) — S-469-40 Elastomer

m/e	298 (25)	523 (250)	773 (500)	873 (600)	973 (700)		
14	1208	1218	2273	3979	2109		
15	377	430	4317	12806	3888		
16	4212	3837	4834	6795	4562		
17	12001	10128	9087	7151	6305		
18	35004	27694	24554	19275	16423		
19	117	110	164	166	149		
20	155	139	146	130	105		
21							
22							
23							
24			127	302	86		
25	43	49	416	1030	284		
26	202	235	1836	4689	1159		
27				3953	1176		
28	12320	12355	17485	21562	12447		
29	275	298	1116	3558	779		
30	1720	1845	2000	1921	1439		
31							
32	4556	4413	4568	3771	3233		
33							
34							
35							
36	44	49	82	111	74		
37			104	150	80		
38	49	56			117		
39							
40	1183	1201	1508	1538	1136		
41	64	92	323	506	242		
42							
43				1328			
44	973	969	1263		918		
45		47	1067	5734	619		
46							
47			199	773	98		
48				65			
49							
50	43		219	236	107		
51		55	220	268	109		
52		40	191	230	83		
53				149	72		
54							
55			111	245	88		
56					68		
57			120		103		
58							
59			849	4921	570		
60							
61			583	2394	234		
62				232			
63			96	193	55		
64							
65		42	107	299	77		
66		41			66		
67					46		
68							
69			52	112			
70							
71			152		79		
72							
73			5557	50460	4482		
74				6899	654		
75			1232				
76		44		582	97		
77		58		557	137		
78	44	56	511	464	151		
79			87		49		
80							
81			485	1954	163		
82							
83					45		
84							
85			112	576	59		
86							
87			654	2835	236		
88							
89			816	3270	284		
90			169				
91			176	452	110		
92			63	114	46		
93			51	97	45		
94			54		45		
95							
96			4882	21673	1443		
97							
98					42		
99							
100							
101							
102							
103			1359	5324	446		
104			477	1857	174		
105							
106			99	286	44		
107			79				
108				96			
109							
110			78				
111			85	325	42		
112							
113			46				
114							
115			791	3190	269		
116							
117			467	1969	164		
118							
119			1367	5576	432		
120			260	958	97		
121			188		74		
122			40	100			
123							
124							
125			212	1054	87		
126					43		
127							

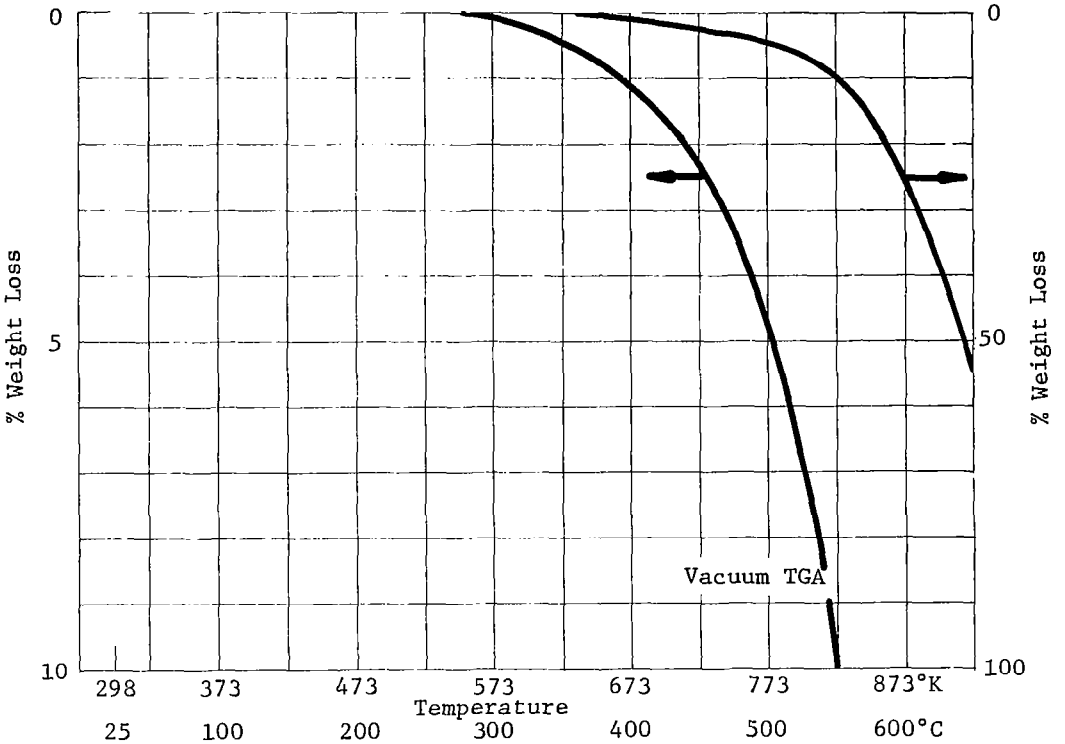
Number and Relative Peak Intensity (Continued)

S-469-40 Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	523 (250)	773 (500)	873 (600)	973 (700)		
128							
129	44	48	89	231	56		
130							
131	49	52			157		
132	42	51	4080				
133				17240	1222		
134							
135							
136							
137							
138							
139							
140				40			
141				45			
142							
143			45	146			
144							
145							
146							
147			1109	7069	655		
148				1870			
149			372				
150							
151							
152							
153			45				
154			54	256			
155							
156							
157							
158							
159			74				
160							
161			499	1953	144		
162							
163			895	3769	270		
164							
165			405	1680	126		
166							
167			57				
168							
169							
170				96			
171							
172							
173							
174							
175							
176							
177			1459	5923	404		
178			497		148		
179							
180							
181			47				
182				43			
183							
184							
185							
186				44			
187							
188							
189							
190							
191			3325	13752	883		
192							
193			1799	7869	538		
194							
195							
196							
197							
198							
199							
200							
201							
202							
203			91				
204							
205							
206							
207		107	23630	98551	5865		
208							
209							
210							
211					43		
212							
213							
214							
215							
216							
217							
218							
219							
220							
221					56		
222			111	476	52		
223					42		
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235			64	282			
236							
237			49	257			
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received, post cured 24 hrs. at 477°K (204°C) at 1×10^{-2} Torr
1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 648°K (375°C) - 1023°K (750°C)

a_o = 72.4% of initial weight

$$k = 5.06 \times 10^2 \exp\left(\frac{-16,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	2.0×10^8	
373°K (100°C)	6.2×10^6	
423°K (150°C)	4.4×10^5	

Number and Relative Peak Intensity

Temperature, °K (°C) S-469-40 Elastomer

m/e	298 (25)	573 (300)	723 (450)	873 (600)	973 (700)		
14	1021	1069	1499	3523	1816		
15	330	390	1918	10719	2811		
16	3707	3547	3660	5250	3813		
17	9530	7832	7180	6126	5914		
18	28393	22642	20055	15927	14233		
19	136	146	163	141	157		
20	141	123	123	115	114		
21							
22							
23							
24			55	215	66		
25		48	156	652	195		
26	155	193	662	3091	805		
27	409	421	790	3160	993		
28	9382	8986	10113	15171	9487		
29	213	266	599	2948	560		
30	1735	1707	1677	1446	1191		
31				256			
32	3376	3180	3148	2559	2352		
33							
34							
35							
36			40	56	46		
37			67	110	55		
38		50	96	163	93		
39							
40	1166	1166	1221	1334	1076		
41	72	104	184	403	203		
42	70	99	140		138		
43				1023			
44	942	990	1006		781		
45		45	169	3918	383		
46			42				
47			47	486	77		
48				55			
49							
50		55	123	155	76		
51		66	140	159	79		
52		47	107	141	62		
53			62	113	58		
54							
55		45	67	175	69		
56			54		51		
57			49		59		
58							
59			124	3290	314		
60							
61			104	1572	151		
62				138			
63			67	131	47		
64							
65		48	72		52		
66			50	195	48		
67			40	107	44		
68				62			
69				75			
70							
71				428	52		
72							
73			533	33540	2057		
74				4093	302		
75			173	3885	334		
76			47	352	64		
77		58		322	83		
78		66	230	276	92		
79			57		44		
80				81			
81			89		95		
82			54				
83							
84							
85			41	345	48		
86							
87			89	1552	127		
88							
89				1989	176		
90					41		
91		43	73	273	72		
92			40	72	41		
93							
94				57			
95							
96			565	11144	719		
97							
98							
99				80			
100							
101							
102							
103			196	3260	271		
104			81	1028	98		
105			80	1016	106		
106				182			
107				147			
108							
109				63			
110							
111				187			
112							
113				102			
114							
115							
116			129	1978	155		
117							
118			75	1196	103		
119							
120			181	3351	245		
121			51	579	58		
122				442	54		
123				68			
124							
125			47				
126				552	59		
127							

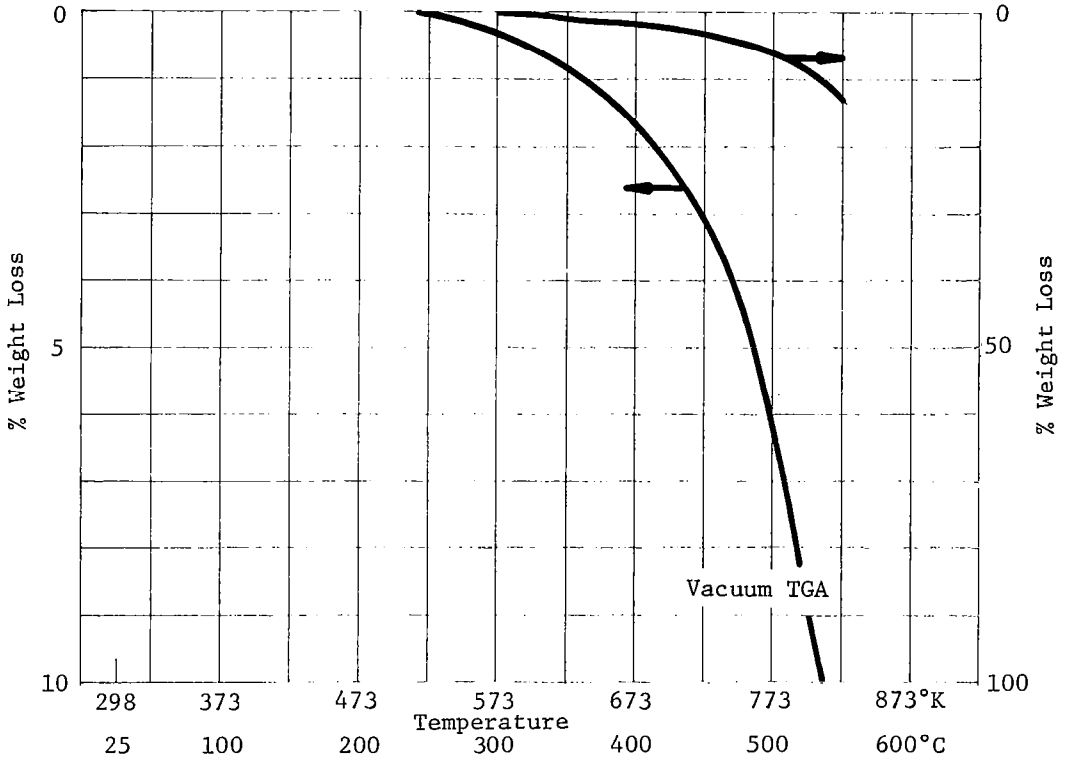
Number and Relative Peak Intensity (Continued)

S-469-40 Elastomer

m/e	Temperature, °K (°C) 298 (25)	573 (300)	723 (450)	873 (600)	973 (700)		
128							
129	44				55		
130			53	142			
131							
132	42	47	72	671	95		
133		44					
134			509	10050	674		
135			113	1789	140		
136			72	1011			
137							
138							
139							
140							
141				40			
142							
143							
144				94			
145							
146				270	42		
147							
148			135	4298	279		
149			58	1104	87		
150			58		82		
151				186			
152				113			
153							
154							
155				143			
156							
157				42			
158				43			
159							
160				155			
161							
162			71	1122	98		
163							
164			114	2177	151		
165			65				
166			66	980	75		
167				202			
168				112			
169							
170							
171				62			
172				42			
173							
174				41			
175							
176							
177							
178			192	3473	233		
179			67	1173	90		
180				1072	85		
181							
182							
183							
184							
185							
186							
187							
188				41			
189							
190				521	52		
191							
192			510	7877	482		
193							
194			244	4862	309		
195			71				
196			40		57		
197							
198				42			
199							
200							
201							
202							
203							
204				211			
205							
206							
207							
208		63	2613	54719	3078		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220				75			
221							
222							
223				268			
224							
225							
226				53			
227							
228							
229							
230							
231							
232							
233							
234							
235							
236				159			
237							
238				152			
239				65			
240				59			

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received, post cured 24 hrs. at 477°K (204°C) at 1×10^{-5} Torr
1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C) — S-469-40 Elastomer

m/e	298 (25)	523 (250)	673 (400)	823 (550)	973 (700)		
14	1199	1268	1589	4362	3655		
15	304	405	1213	10558	7861		
16	3948	4139	4937	9010	8872		
17	11709	10836	12331	14444	12962		
18	34732	153	34498	39836	34494		
19	147	141	150	209	199		
20	138		176	243	226		
21							
22							
23							
24			47	325	208		
25							
26	202		689	5419	3203		
27							
28	12104	13285	17854	34947	28245		
29							
30	1777	2026	2627	3557	3137		
31							
32	4425	4807	5968	7591	6749		
33							
34				45	68		
35							
36				79			
37							
38							
39							
40	1133	1267	1676	2559	2453		
41		82	191	579	1004		
42							
43							
44	960	1086	1528		2546		
45				4095			
46			41				
47			44	588	297		
48					88		
49							
50		61	160	444	316		
51		63	156	443	311		
52		41		365	280		
53			43	171			
54							
55			82	230	557		
56			68		320		
57			53		309		
58							
59			146	3471	1523		
60							
61			141	1969	864		
62				232	176		
63			45				
64							
65							
66			49	299	235		
67							
68							
69				98			
70					358		
71			40				
72							
73			480	32276	11630		
74				5759	2225		
75			257				
76				647			
77				1008	522		
78		120	383				
79							
80							
81			145	1956	869		
82							
83							
84							
85				442	210		
86							
87			167	2634	1045		
88							
89			214		1213		
90			63	2967			
91			65				
92							
93				72			
94							
95							
96			1261	21121	8210		
97							
98							
99							
100							
101							
102							
103			312	4567	1779		
104			131				
105							
106							
107							
108							
109							
110							
111				324	143		
112							
113							
114							
115					1113		
116			196	2716			
117							
118			102				
119			311	4759	1874		
120							
121							
122			41				
123							
124							
125					310		
126				937			
127							

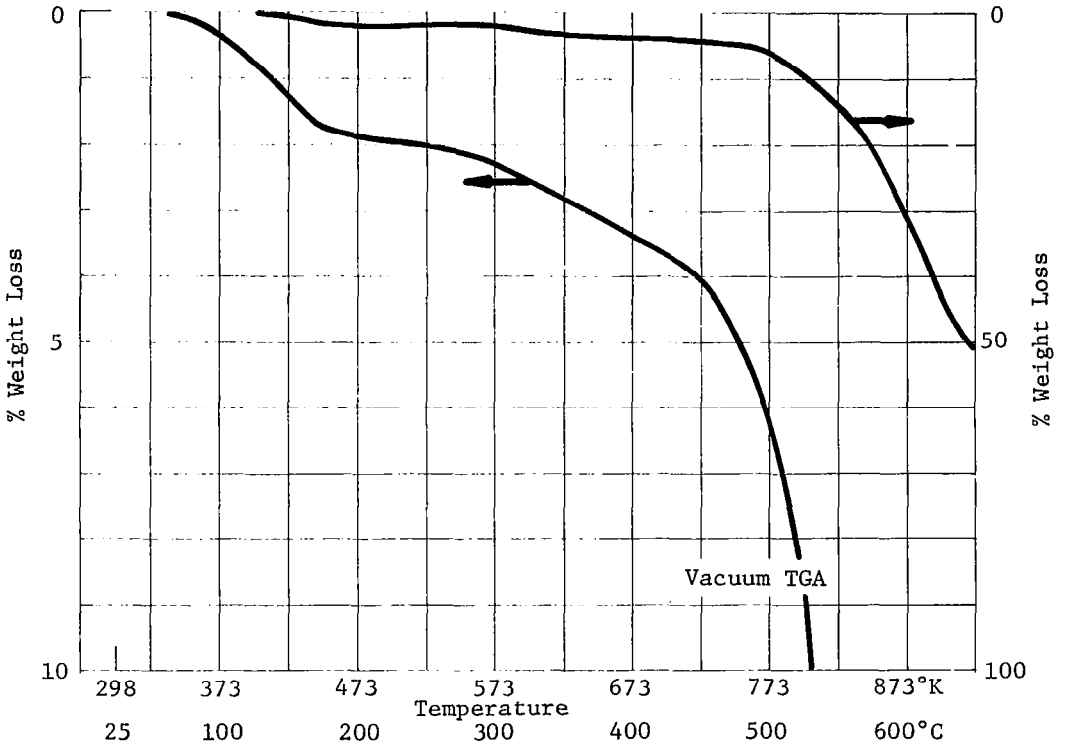
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 298 (25)	523 (250)	673 (400)	823 (550)	973 (700)	S-469-40 Elastomer	
128							
129			58				
130							
131	48	50					
132		44					
133			911	15035	5434		
134							
135							
136							
137					45		
138							
139							
140							
141				41			
142							
143							
144							
145							
146							
147			224	5187			
148					2007		
149			82				
150							
151							
152							
153							
154							
155				238	124		
156							
157							
158							
159							
160							
161							
162							
163							
164			206	3301	1231		
165							
166			94				
167							
168							
169							
170							
171				80	44		
172							
173							
174							
175							
176							
177							
178			334	5414	1899		
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192			803	12810	4317		
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204				373			
205							
206							
207							
208		62	5573	93798	31083		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% R.H.



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1023°K (750°C)

a_o = 57.2% of initial weight

$$k = 2.40 \times 10^{7} \exp\left(\frac{-32,800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	4.7×10^{14}	
373°K (100°C)	4.8×10^{11}	
423°K (150°C)	2.5×10^{9}	

Number and Relative Peak Intensity

Temperature, ^{o} K (^{o}C) S-595-50 Elastomer

m/e	423 (150)	623 (350)	723 (450)	823 (550)	923 (650)		
14	3297	3253	3798	8142	736		
15	865	1175	3232	24092	2120		
16	9773	9547	10255	15769	1484		
17	26627	23824	23534	22943	2147		
18	74589	64537	62309	60007	5485		
19	199	193	228	253			
20	230	236	215	224			
21							
22							
23							
24			86	620			
25	69	96					
26		643	1762	9604	717		
27							
28	26138	26641	29266	48844	4335		
29				8977	702		
30	3716	3895	3940	4552	380		
31							
32	8441	8033	8310	7927	703		
33							
34							
35							
36				90			
37							
38							
39				2386			
40	1549	1644	1733		157		
41	163	255	556	1161			
42							
43				3282	251		
44	1842	1824	2078				
45	60	122		7672	591		
46			114				
47			87	1429	62		
48							
49		49					
50	66	344	686	1230			
51	62	306	673	1248			
52	42	198					
53		44	84				
54	46	75	145				
55	69	111	190	483			
56	41	79	138				
57	42	48	109				
58							
59			490	6352	473		
60	46						
61	45	115	427	5216	338		
62				701			
63		89	186				
64		43					
65		55	122				
66			95	699			
67		41	87				
68			57				
69			52	198			
70		46	74				
71			110		56		
72		44					
73		101	2311	23435	2242		
74		70	963	10735			
75		67			788		
76					58		
77	95			3255	72		
78	82	932	1884		44		
79			175				
80							
81			383	5312	341		
82							
83			73				
84			61				
85			72				
86							
87			443	6612	438		
88					620		
89			666	9407			
90		68					
91	40	95	350				
92			109				
93							
94							
95			57				
96		197	3919	56886	3991		
97		43					
98							
99							
100			45				
101							
102							
103		49	1060	13615	938		
104							
105							
106			74				
107			44				
108							
109							
110							
111			47	510			
112							
113							
114							
115			540	7719	494		
116							
117							
118							
119			995	13289	864		
120							
121							
122							
123							
124							
125			149	1311	47		
126			52				
127			42				

Number and Relative Peak Intensity (Continued)

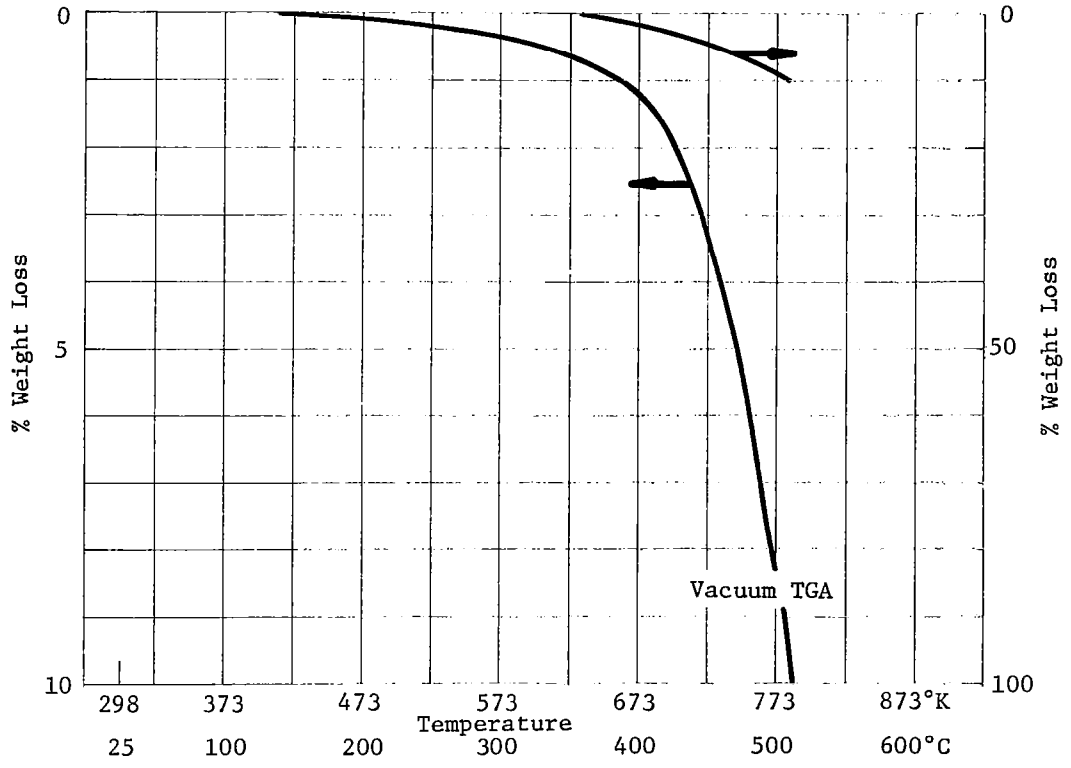
S-595-50 Elastomer

m/e	Temperature, °K (°C) 423 (150)	623 (350)	723 (450)	823 (550)	923 (650)		
128							
129	79	66	110				
130		40					
131	96	104					
132		138					
133			3316	41290	2758		
134		40					
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145			45				
146							
147			784	10828	730		
148							
149							
150							
151			45				
152							
153							
154				191			
155				199			
156				93			
157							
158							
159							
160							
161							
162							
163			760		613		
164				9900			
165							
166			59				
167			65				
168							
169				53			
170				53			
171				54			
172				52			
173							
174							
175							
176							
177		41	1361				
178				17619	1040		
179							
180							
181			56				
182							
183							
184							
185							
186							
187				45			
188							
189							
190		47					
191							
192		113	3299	40367	2413		
193		50					
194		53					
195							
196							
197							
198				71			
199							
200							
201							
202							
203							
204							
205							
206				101095			
207							
208		1052	25234		19853		
209							
210							
211							
212							
213				55			
214							
215							
216							
217							
218				88			
219							
220				225			
221							
222			78				
223			87	1226			
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236			41	299			
237				177			
238							
239				47			
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Temperature, °K (°C) — S-1669 Elastomer

m/e	298 (25)	573 (300)	673 (400)	773 (500)			
14	2420	2365	2878	6233			
15	1043	1043	2953	16158			
16	6214	5464	6283	11307			
17	22794	17143	16097	15437			
18	74419	54040	51576	47577			
19	896	892	1037	1178			
20	962	911	843	1008			
21							
22							
23							
24			128	460			
25	120	145	445	1671			
26	657	727	2130	7442			
27	857	887	1407	5059			
28	27868	26718	30076	44557			
29	674	754	1163	4511			
30	704	683	748	1079			
31	162	218	274	551			
32	6513	5999	5757	4791			
33							
34			41				
35	42		45	63			
36	182	196	217	330			
37	43		59	146			
38	95	93	157	281			
39	228	210	347	750			
40	4643	4588	4928	5996			
41	228	204	296	638			
42	165	171	224	535			
43	249	268	415	1674			
44	1137	1219	1310	1783			
45	129	147	693	5099			
46			52	330			
47			129	936			
48				51			
49			48	63			
50	65	80	146	147			
51	74	64	102	157			
52	44		52	123			
53			43	135			
54				61			
55	100	71	121	277			
56	45		54	107			
57		43	55	270			
58			59	430			
59			419	3647			
60			45	365			
61			267	2542			
62				180			
63			48	175			
64	75	72	82				
65	100	72	82				
66		82	123	325			
67	42	46	52	156			
68				55			
69				62			
70				57			
71			44	353			
72				447			
73		54	2010	16438			
74			217	2026			
75			487	4594			
76			47	322			
77	41	51	86	350			
78			66	125			
79		47	172	307			
80							
81			185	1761			
82	40		131	995			
83			52	220			
84	164	177	175	277			
85			55	303			
86	43	41	47	172			
87			160	1780			
88			97	1022			
89			289	2862			
90				324			
91	47	44	62	238			
92				48			
93							
94							
95							
96		48	1681	16204			
97							
98							
99				49			
100							
101				117			
102			47	480			
103			313	3351			
104			76	841			
105			108	973			
106				102			
107				119			
108							
109							
110				63			
111				128			
112				50			
113				43			
114							
115			147	1537			
116				218			
117			63	731			
118				297			
119			238	2534			
120				299			
121				286			
122							
123							
124							
125			44	365			
126				78			
127							

Number and Relative Peak Intensity (Continued)

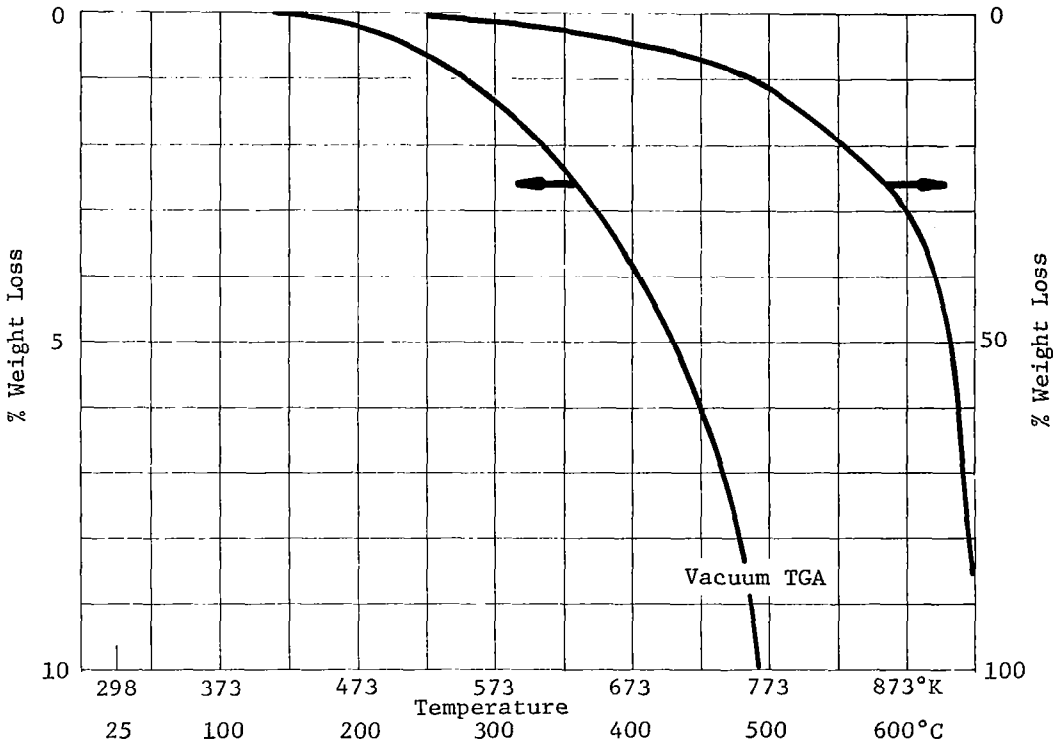
S-1669 Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	573 (300)	673 (400)	773 (500)			
128							
129	178	170	164	281			
130							
131	118	142	151	375			
132	163	143	177	499			
133			608	5608			
134	49	45	94	814			
135			52	478			
136				61			
137							
138							
139							
140							
141							
142							
143							
144							
145				44			
146				42			
147			53	768			
148				95			
149				233			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				165			
162							
163				270			
164							
165				79			
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				181			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191				61			
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207				107			
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 423°K (150°C) - 1023°K (750°C)

a_o = 57.2% of initial weight

$$k = 1.35 \times 10^4 \exp\left(\frac{-20,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.8×10^9	
373°K (100°C)	5.1×10^7	
423°K (150°C)	1.9×10^6	

Number and Relative Peak Intensity

Temperature, °K (°C) — SE-5211 Elastomer

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	2149	2887	4298	6865	8417		
15	758	3461	8511	20496	27162		
16	4480	5386	7889	12214	16002		
17	17071	13082	12384	12582	12496		
18	56948	41826	40201	39249	38389		
19	252	355	348	259	262		
20	451	471	554	641	625		
21							
22							
23							
24		111	288	699	733		
25	57	522	1160	2596	2761		
26	553	2525	5352	11959	12407		
27	559	1443	2719	6915	8004		
28	26591	30678	36597	48027	51308		
29	437	1214	2221	5911	6934		
30	323	428	531	900	1048		
31	96	313	348	691	809		
32	5740	5494		5458	5523		
33							
34							
35							
36			65	138	83		
37		80	408	694	374		
38		141	542	964	552		
39	139	565	1586	2964	2126		
40	3272	3694	4367	5382	5545		
41	134	313	477	913	1136		
42	69	167	308	708	903		
43	113	401	819	2222	2909		
44	606	2051	2449	1747	1948		
45	41	727	2096	6881	8439		
46			120	394	506		
47		85	347	1172	1373		
48				80	48		
49		53	239	401	143		
50		375	1495	2390	919		
51		413	1700	2907	1188		
52		289	1334	2165	793		
53			109	315	305		
54				52	79		
55		97	139	395	510		
56		42	53	118	163		
57		45	94	350	446		
58			129	619	920		
59		404	1245	4631	6282		
60			115	526	621		
61		378	1105	3751	4430		
62			117	376	353		
63		58	382	819	582		
64				131	103		
65		59	234	593	542		
66		90	163	426	496		
67		46	66	180	225		
68				66	61		
69				84	108		
70				56	68		
71			106	501	619		
72		42	130	608	753		
73		1298	5277	20230	27843		
74		272	1010	3196	3680		
75		659	2013	6544	7637		
76		64	381	845	651		
77		332	1320	2410	1194		
78		1108	4927	7369	2096		
79		125	405	766	382		
80			41				
81		211	659	2341	2815		
82		136	382	1367	1665		
83			78	268	327		
84	78	122	149	224	277		
85			74	384	488		
86			59	207	248		
87		219	707	2570	3090		
88		110	427	1519	1776		
89		396	1225	4217	4843		
90			99	433	561		
91		152	813	2056	1491		
92			239	464	415		
93				121	125		
94				40			
95							
96		2605	7268	23568	27482		
97							
98				84	117		
99					43		
100							
101				171	229		
102		45	162	769	855		
103		444	1446	4827	5499		
104		84	302	1307	1559		
105		111	485	1580	1791		
106				154	187		
107				148	163		
108							
109							
110					44		
111				90	151		
112					49		
113				48	54		
114							
115		184	659	2310	2696		
116			52	345	496		
117		70	302	1137	1329		
118			72	346	426		
119		379	1180	3862	4362		
120			122	442	482		
121			84	429	479		
122							
123							
124							
125			59	268	413		
126				72	111		
127				54			

Number and Relative Peak Intensity (Continued)

SE-5211 Elastomer

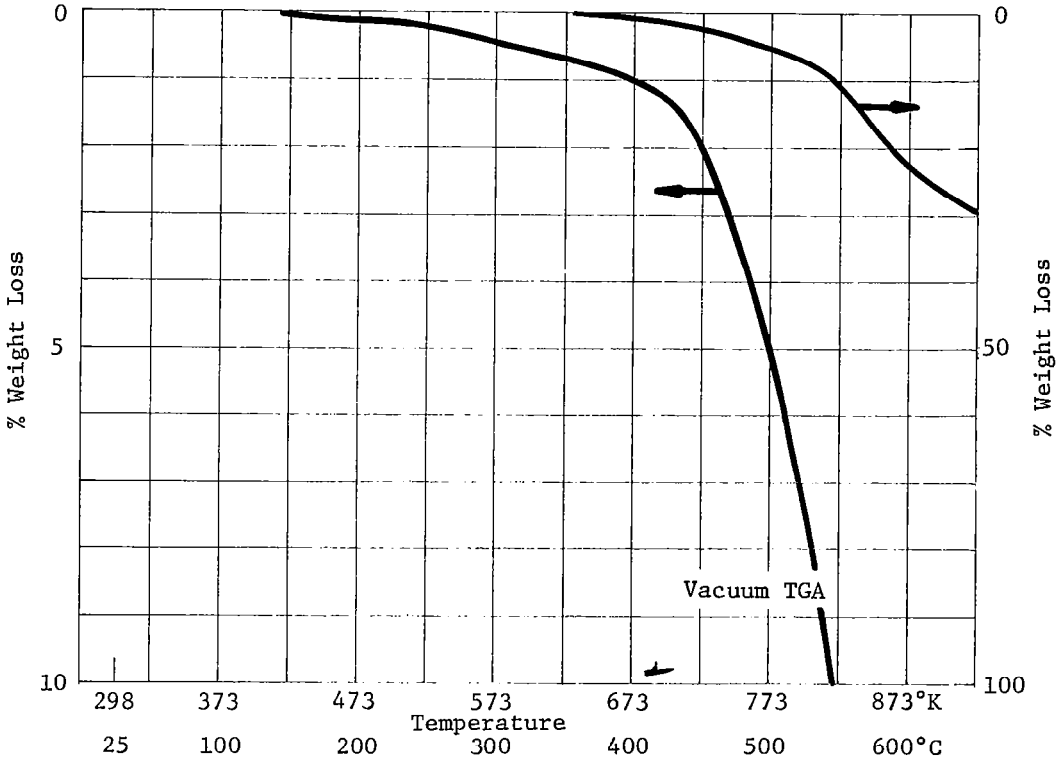
m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	80	133	175	290	317		
130							
131	51	111	191	450	526		
132	62	141	298	577	659		
133		811	2463	8009	9259		
134		108	326	1143	1316		
135		44	198	805	843		
136				90	105		
137							
138							
139							
140							
141							
142							
143							
144							
145				43	61		
146				61	58		
147		74	313	1259	1438		
148				162	172		
149			85	357	395		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				260	271		
162				40	54		
163			127	517	527		
164				48	45		
165				155	158		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			54	338	330		
178							
179				41	46		
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191				205	199		
192							
193				41	60		
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207			46		166		
208				236	195		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Silicone Blanket Laminate
4425051-9033

Chemical Characterization Summary

Mix Ratio: As Received
Cure: Post cured 24 hrs. at 477°K (204°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 1073°K (800°C)

a_o = 38.8% of initial weight

$$k = 2.07 \times 10^4 \exp\left(\frac{-21,000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	5.1×10^9	
373°K (100°C)	6.2×10^7	
423°K (150°C)	2.2×10^6	

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Blanket Laminate 4425051-9033

m/e	298 (25)	523 (250)	773 (500)	873 (600)	1023 (750)		
14	1508	1535	4143	1971	6078		
15	445	442	12458	8375	18056		
16	3593	3299	12292	4299	20108		
17	15228	13103	11993	3497	11333		
18	56836	45451	38824	11881	35923		
19	730	866	1110	359	2587		
20	703	714	851	356	1289		
21							
22							
23							
24					88		
25			77	84	390		
26	125	176	987	825	2833		
27	443	559	2821	2801	4277		
28	32172	32302	39008	15891	42903		
29	430	506	3474	419	2587		
30	625	699	875	350	1198		
31	123	168	422	2133	847		
32	7115	6825	6960		6748		
33							
34							
35							
36					84		
37					124		
38			56	44	285		
39	51	93	404	315	1337		
40	3783	3880	4338	1880	5190		
41	49	96	414	249	1267		
42		65	330	253	938		
43	88	191	1500	1546	1983		
44	818	903	1639	828	2151		
45			4017	5028	3383		
46			170	281	137		
47			782	1117	1695		
48					98		
49					197		
50			61		196		
51			127	98	375		
52			88	78	110		
53			53	74	305		
54					175		
55			222	202	363		
56			74		164		
57			174	229	316		
58			324	492	605		
59			3155	3884	3089		
60			293	393	248		
61			2876	3606	1062		
62			102	217	75		
63			129	192	281		
64					211		
65			82		215		
66			204	298	331		
67			76	85	225		
68							
69				52	251		
70					49		
71			363	514	182		
72			432	602	246		
73			11897	13111	14124		
74			1863	2227	1374		
75			5529	6679	3101		
76			338	517	209		
77			441	514	1512		
78			236	90	339		
79			213	169	2787		
80					303		
81			2538	3190	3895		
82			1403	1638	536		
83			174	264	196		
84			44		42		
85			450	505	265		
86			122	194	48		
87			2718	3274	939		
88			1604	1915	421		
89			4315	5161	1179		
90			443	592	111		
91			531	512	205		
92			71	42	61		
93					104		
94			45		222		
95							
96			30798	34414	7937		
97					89		
98					87		
99				66			
100							
101			197	322	64		
102			865	1115	224		
103			6239	7296	1710		
104			1446	1708	313		
105			1857	2236	565		
106			142	248	43		
107			176	245	59		
108							
109							
110			40	76			
111			139	239	65		
112			40	84			
113			44	116	156		
114							
115			3500	4027	982		
116			506	603	88		
117			1713	1970	492		
118			630	695	142		
119			6208	6799	1532		
120			666	845	132		
121			676	798	149		
122							
123							
124							
125			478	895	327		
126			91		175		
127							

Number and Relative Peak Intensity (Continued)

Silicone Blanket Laminate
4425051-9033

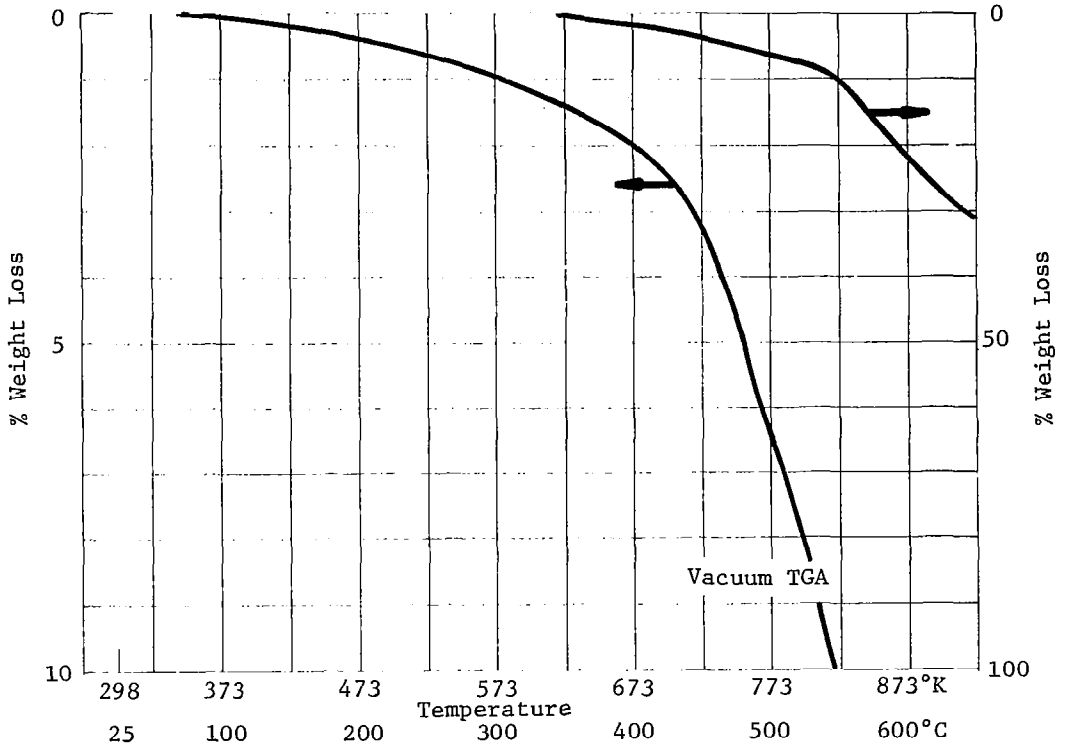
m/e	Temperature, °K (°C)						
	298 (25)	523 (250)	773 (500)	873 (600)	1023 (750)		
128							
129			98	135	67		
130							
131			597	703	922		
132			958	1036	332		
133			17094	17261	4188		
134			2297	2508	541		
135			1432	1618	364		
136			64	103			
137					47		
138							
139							
140							
141							
142							
143			44	89			
144							
145			168	278	58		
146			216	322	101		
147			3486	3667	1113		
148			503	642	121		
149			1213	1212	308		
150			63	138			
151			56	92	78		
152							
153							
154				97			
155				71	225		
156					41		
157							
158							
159			90	145			
160							
161			1497	1536	220		
162			457	584	102		
163			2843	2975	678		
164			388	492	68		
165			1124	1154	192		
166			86	131			
167			40				
168							
169							
170							
171							
172							
173							
174							
175			104	181			
176			821	813	90		
177			4497	4205	766		
178			847	862	90		
179			878	903	144		
180			73	99			
181							
182							
183							
184							
185							
186							
187							
188							
189			307	351	50		
190			127	159			
191			8706	7468	1547		
192			1692	1517	250		
193			3523	3159	791		
194			558	506	90		
195			218	238	49		
196							
197							
198							
199							
200							
201							
202							
203			46	88			
204							
205			96	130	109		
206			110	128			
207			60036	50118	9058		
208			12505	10204	1706		
209			7171	5866	1020		
210			872	758	48		
211			195	187	52		
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222			85	71			
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Silicone Heater
Blanket 101-103

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1023°K (750°C)

a_o = 36.8% of initial weight

$$k = 9.35 \times 10^3 \exp\left(\frac{-19,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.6×10^9	
373°K (100°C)	2.5×10^7	
423°K (150°C)	1.1×10^6	

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Heater Blanket 101-103

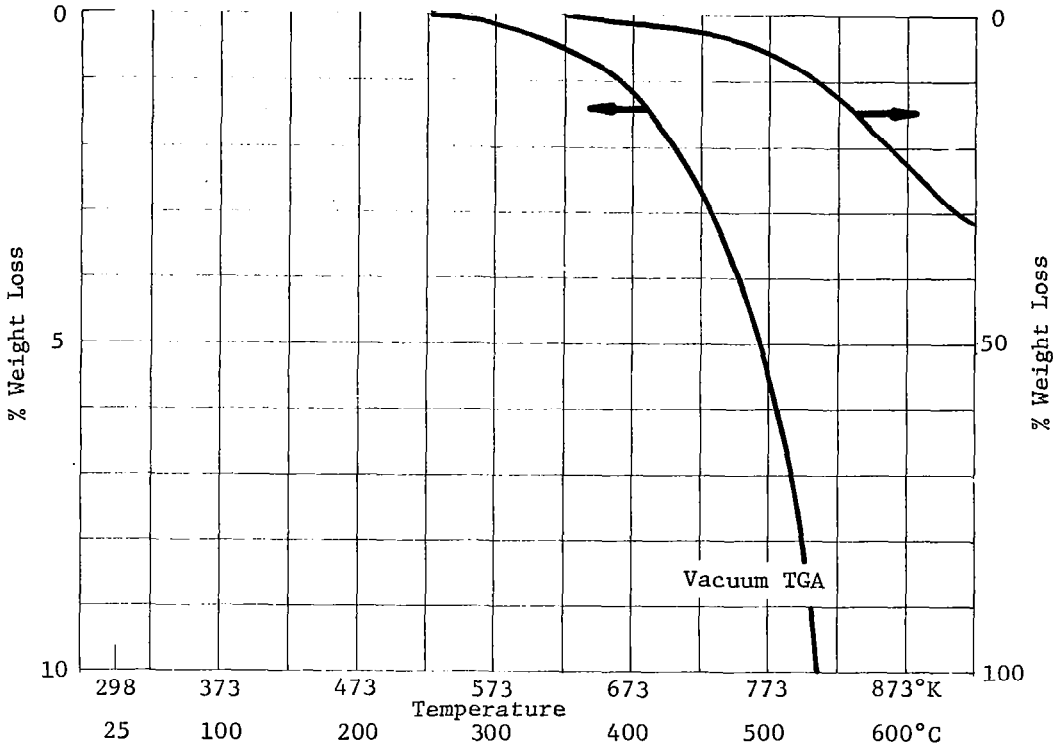
m/e	298 (25)	573 (300)	723 (450)	823 (550)	923 (650)		
14	1243	1234	1873	3479	3091		
15	175	203	2900	9784	7241		
16	2130	1993	2940	5295	4939		
17	8917	7524	6366	6055	5538		
18	32416	26310	22110	20887	19190		
19			50	43			
20	74	75	71	87	72		
21							
22							
23							
24				69			
25			142				
26	62	132	1532	4821	3230		
27							
28	20790	20016	22843	29769	25012		
29	117	225	945	2904	1569		
30	43	44	61	137	81		
31		40	58				
32	5062	4530	3936	3892	3660		
33							
34							
35							
36							
37							
38							
39							
40	1134	1069	1167	1647	1346		
41			71	122	119		
42				84			
43		171		700	369		
44	168	286	457				
45			487	2488	1454		
46							
47				279	118		
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59			238	1702	896		
60							
61			174	1375	506		
62							
63							
64							
65							
66				75	61		
67							
68							
69							
70							
71				67			
72							
73			1421	7055	5959		
74			67				
75		43	700	2876	1378		
76				60			
77				77			
78				44			
79					46		
80							
81			127	1129	363		
82				586	152		
83			55	60			
84							
85							
86							
87			141	1199	398		
88			44		153		
89			287	1990	734		
90				91			
91				43			
92							
93							
94							
95			63				
96			4068	15500	6906		
97							
98				60			
99							
100							
101							
102				290	52		
103			436	2489	925		
104				378	77		
105			48	513	141		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			151	1231	350		
116				50			
117					83		
118				414			
119				141			
120			382	2313	842		
121				87			
122							
123							
124							
125							
126							
127							

Silicone Heater
Blanket 101-103

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1023°K (750°C)

a_o = 38.8% of initial weight

$$k = 2.41 \times 10^4 \exp\left(\frac{-21,100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	5.7×10^9	
373°K (100°C)	6.7×10^7	
423°K (150°C)	2.3×10^6	

Isothermal weight loss in nitrogen = 0.10%

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Heater Blanket 101-103

m/e	298 (25)	573 (300)	673 (400)	773 (500)	923 (650)		
14	1087	1004	1173	1868	2185		
15	476	474	1076	3564	4463		
16	3718	3483	3611	4756	4592		
17	11815	9245	8614	7933	6867		
18	34821	25391	24139	21212	18021		
19	131	117	126	171	201		
20	222	219	216	210	189		
21							
22							
23							
24				83	105		
25			118	269	315		
26	195	205	551	1188	1494		
27	400	410	606	1055	1340		
28	9873	9399	10184	12072	11692		
29	255	270	430	842	998		
30	951	983	1005	1020	876		
31	152	143	150	186	171		
32	3009	2751	2719	2534	2165		
33							
34							
35							
36			44	57	58		
37					43		
38			44	57	71		
39		65	109	156	186		
40	1642	1619	1662	1687	1561		
41	55	67	122	128	143		
42	50	56	76	101	119		
43	74	83	131	266	291		
44	636	653	753	732	644		
45			143	537	700		
46				44	61		
47				122	136		
48							
49							
50			44	51	53		
51				52	53		
52							
53							
54							
55				46	57		
56							
57					48		
58				58	75		
59			85	372	481		
60				49	60		
61			72	321	361		
62							
63				40			
64							
65				41			
66				56	62		
67							
68							
69							
70							
71				53	59		
72				59	74		
73			218	1031	1688		
74			40	176	252		
75			115	521	622		
76				52	54		
77				62	67		
78				42	40		
79				42			
80							
81			47	209	224		
82				124	132		
83							
84				45	40		
85					45		
86							
87			48	215	233		
88				124	138		
89			79	355	393		
90				54	60		
91				54	53		
92							
93							
94							
95							
96			388	1926	2014		
97							
98							
99							
100							
101							
102				75	74		
103			86	410	445		
104				94	101		
105				122	124		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115			45	194	194		
116							
117				85	93		
118				40	44		
119			64	309	299		
120				40	48		
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

Silicone Heater Blanket 101-103

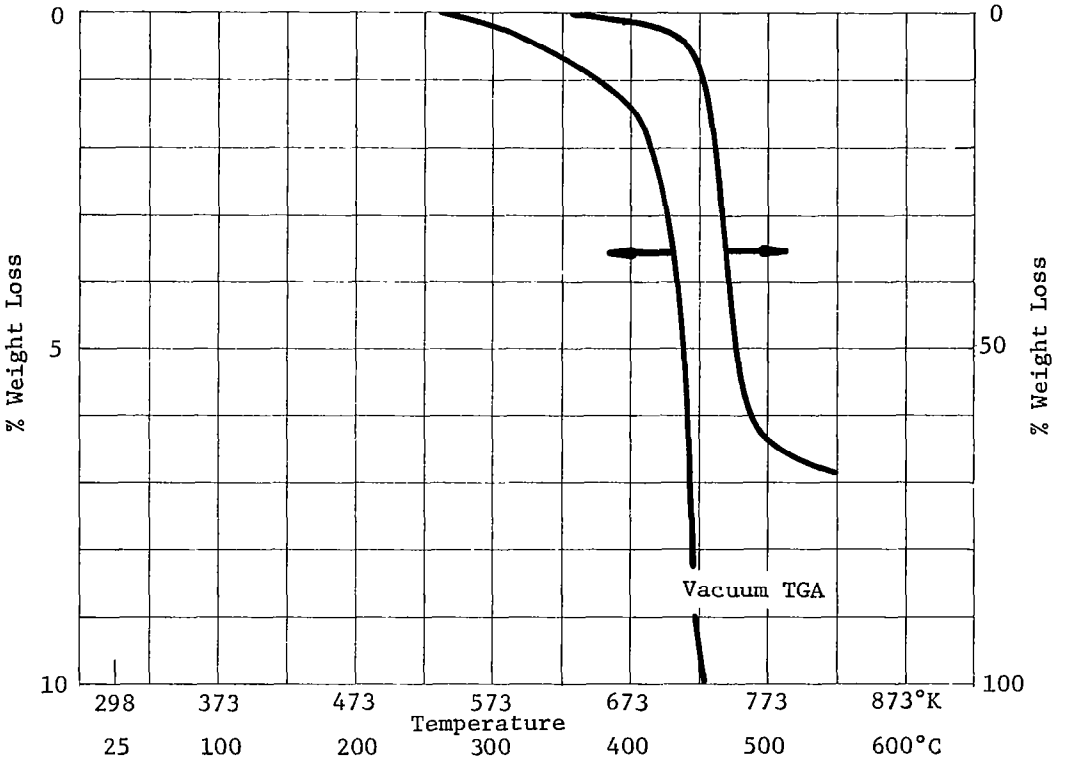
m/e	Temperature, °K (°C) 298 (25)	573 (300)	673 (400)	773 (500)	923 (650)		
128							
129	43			51	42		
130							
131				52	47		
132			43	66	61		
133			119	598	580		
134				92	93		
135				62	50		
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147				81	88		
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Silicone Seal Assembly
P/N 5722013-101

Chemical Characterization Summary

Mix Ratio: As Received
Cure: Post cured 24 hrs. at 412°K (139°C)

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 523°K (250°C) - 823°K (550°C)

a_o = 69.1% of initial weight

$$k = 6.32 \times 10^{7} \exp\left(\frac{-30,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	6.7×10^{12}	
373°K (100°C)	1.1×10^{10}	
423°K (150°C)	7.8×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Seal Assembly
P/N 5722013-101

m/e	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
14	1507	1366	1500	1718			
15	417	438	518	693			
16	4369	3800	4759	4160			
17	22269	17149	18578	16066			
18	83833	57337	66828	56336			
19	2033	1784	2252	10515			
20	1909	1358	2138	40211			
21							
22			58				
23							
24				169			
25			85	424			
26	286	363	641	1320			
27	704	667	949	1866			
28	33612	32308	36241	42123			
29	661	762	891	1226			
30	1052	1051	1178	1508			
31	266	390	1215	9059			
32	7086	6417	6150	6279			
33			142	1650			
34							
35	48		56	134			
36	433	334	383	1040			
37			69	660			
38	115	107	195	1105			
39	51	105	272	2578			
40	3767	3656	4031	5158			
41	53	99	121	300			
42	77	61	109	153			
43	135	207	341	791			
44	1747	3516	17265	8359			
45	60	64	547	3953			
46			153	1231			
47				1066			
48				139			
49				202			
50		45	273	3414			
51		51	2166	16599			
52			58	264			
53				61			
54							
55			52	463			
56			97	1140			
57			247	2860			
58				185			
59			58	972			
60				476			
61				260			
62			43	666			
63			165	1694			
64			687	7380			
65			291	2372			
66				480			
67				86			
68			52	762			
69			2270	20635			
70				545			
71				141			
72				54			
73				75			
74			52	710			
75			840	8063			
76			57	735			
77			743	7357			
78			88	273			
79				244			
80				237			
81			132	1405			
82			92	1154			
83			69	779			
84				68			
85	80	61	196	2664			
86				288			
87				468			
88			74	1321			
89			81	1226			
90				358			
91			48	295			
92				175			
93			202	2014			
94			146	1271			
95			872	6692			
96			46	359			
97				47			
98				73			
99			40	981			
100			86	892			
101			263	2479			
102				320			
103				158			
104				122			
105				278			
106			53	680			
107				448			
108			65	1668			
109			41	844			
110				404			
111				101			
112			41	551			
113			2100	15555			
114			92	1059			
115			297	2689			
116				86			
117				214			
118				81			
119			105	1789			
120				156			
121				649			
122				74			
123				77			
124				208			
125			82	813			
126				797			
127			52	661			

Number and Relative Peak Intensity (Continued)

Silicone Seal Assembly
P/N 5722013-101

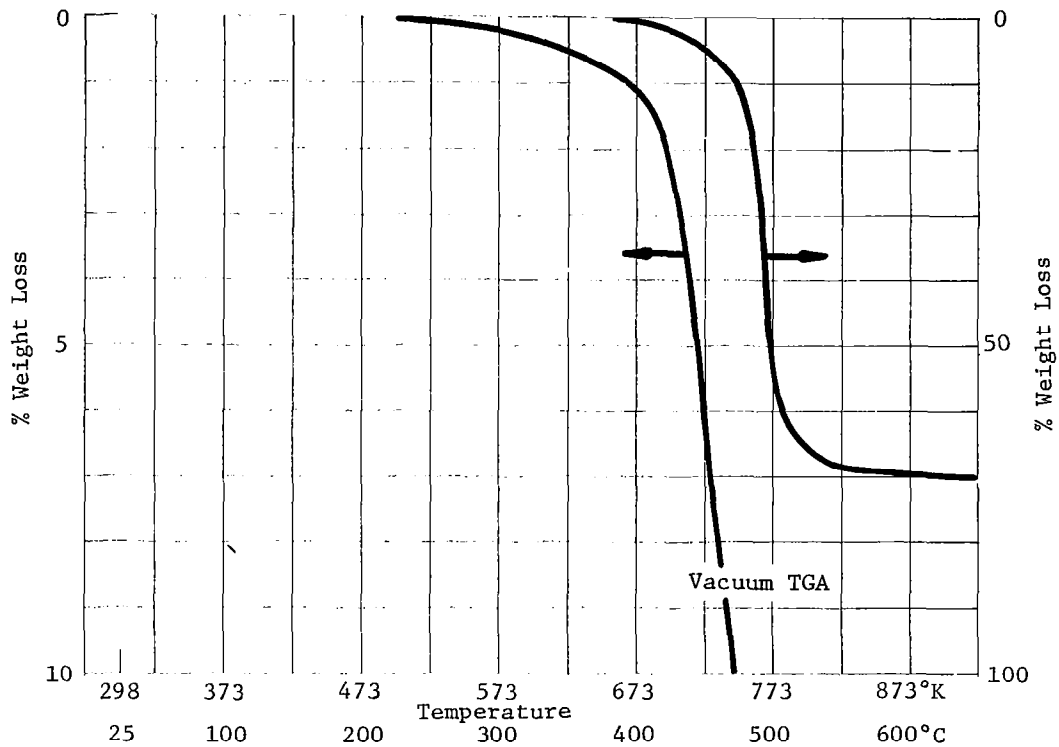
m/e	Temperature, °K (°C) 298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
128				77			
129				111			
130				73			
131			73	758			
132			167	991			
133			263	3358			
134				101			
135							
136							
137			57	750			
138				121			
139			86	1140			
140				109			
141				48			
142							
143				209			
144				685			
145			203	1563			
146				63			
147				112			
148'							
149				44			
150				427			
151				493			
152				67			
153				91			
154							
155				41			
156				62			
157			71	809			
158				289			
159				230			
160				66			
161				53			
162				47			
163			1556	4854			
164			41	221			
165			41	376			
166							
167							
168				57			
169				451			
170				63			
171				189			
172							
173							
174							
175				238			
176				153			
177				116			
178							
179				66			
180							
181				229			
182				50			
183				60			
184							
185							
186							
187				93			
188							
189				225			
190							
191							
192							
193							
194				276			
195				133			
196							
197							
198							
199							
200				50			
201				44			
202							
203							
204							
205							
206							
207				146			
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Silicone Solenoid Seal Assembly
P/N 5722013-101 Rev. C

Chemical Characterization Summary

Mix Ratio: As Received
Cure: 24 hrs. at 407°K (134°C) at 1 x 10^{-5} Torr

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 823°K (550°C)

a_o = 68.7% of initial weight

$$k = 1.88 \times 10^{8} \exp\left(\frac{-32{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	3.5×10^{13}	
373°K (100°C)	3.8×10^{10}	
423°K (150°C)	2.1×10^{8}	

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Solenoid
Seal Assembly
P/N 5722013-101 Rev. C

m/e	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
14	1826	1803	1960	2531	2397		
15	620	566	671	983	827		
16	4695	4317	5991	5084	5032		
17	21491	17947	21627	20941	17762		
18	81066	65205	78890	73164	62700		
19	2659	2502	3344	17678	10822		
20	1410	1162	1899	50156	21961		
21							
22			73	41			
23							
24				319	88		
25		55	129	843	288		
26	347	491	873	2281	871		
27	770	813	1080	2855	1295		
28	37507	37388	44629	55790	54048		
29	793	915	1097	1667	1394		
30	1193	1202	1387	1959	1578		
31	312	501	1310	13833	5230		
32	7788	7180	7219	8150	8119		
33			117	2938	1117		
34				41			
35	159	105	124	365	198		
36	1196	843	893	2092	1376		
37	46	57	98	1178	351		
38	328	284	420	2099	745		
39	77	117	316	4483	1110		
40	3999	4119	4410	6886	5361		
41	115	141	196	459	270		
42	96	97	153	221	156		
43	191	249	443	1252	601		
44	1685	4785	20691	12033	8300		
45	81	81	590	6667	2514		
46			188	2216	370		
47			48	1441	808		
48				289	131		
49				354	82		
50		63	307	5469	1897		
51	53	86	2160	29566	5478		
52			52	455	82		
53				144	44		
54							
55			76	787	207		
56			107	1910	457		
57			231	5008	1126		
58				316	65		
59			60	1861	291		
60				1012	158		
61				430	91		
62				1194	319		
63			157	2689	897		
64			763	13008	3635		
65			304	4789	875		
66				739	437		
67				168	83		
68			48	1402	309		
69			41	35387	8470		
70				1063	180		
71				288	51		
72				135			
73				116	42		
74			72	1301	283		
75			849	14823	3499		
76			73	1387	348		
77		63	742	13648	2641		
78	40		119	638	154		
79				439	137		
80				411	69		
81			131	2409	772		
82			107	2167	542		
83			64	1525	327		
84				175	71		
85	41	42	232	3687	5953		
86				542	312		
87				871	329		
88			88	2514	554		
89			79	2650	435		
90				726	102		
91			67	584	134		
92				295	64		
93			206	3612	876		
94			145	2427	594		
95			1022	13071	2686		
96			41	956	183		
97				128			
98				178			
99			50	1586	337		
100			60	1739	531		
101			254	4998	980		
102				615	102		
103				355	86		
104				206	150		
105				512	240		
106			65	1401	281		
107				916	155		
108			64	3291	769		
109			61	1831	229		
110				982	106		
111				271			
112				1057	238		
113			1844	31747	7507		
114			99	2208	513		
115			223	5654	516		
116				178	73		
117				444	79		
118				168	50		
119			118	3472	802		
120				411	71		
121				1439	230		
122				211	53		
123				176			
124				627	105		
125			88	1706	293		
126				1569	418		
127			56	1384	178		

Number and Relative Peak Intensity (Continued)

Silicone Solenoid
Seal Assembly
P/N 5722013-101 Rev. C

Temperature, °K (°C)

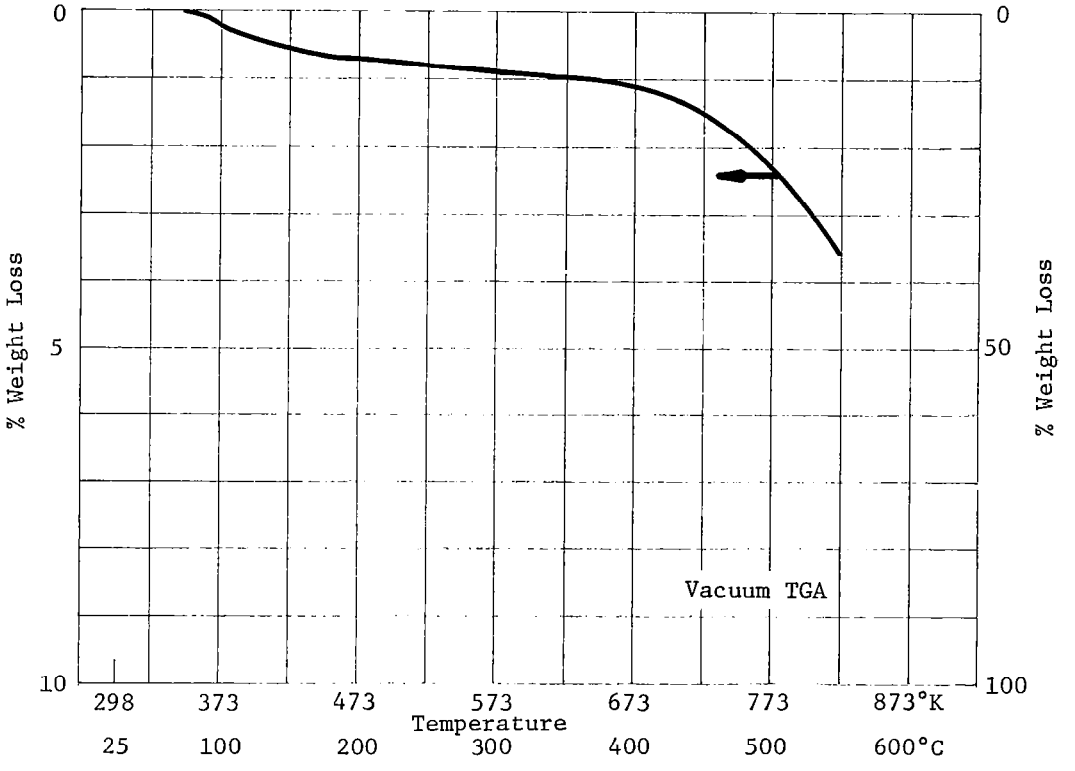
m/e	298 (25)	573 (300)	673 (400)	773 (500)	873 (600)		
128				238			
129				270	63		
130				157			
131			93	1527	597		
132			183	1922	648		
133			227	6852	932		
134				273	42		
135				75			
136				83			
137			51	1502	290		
138				330	47		
139			97	2537	517		
140				348			
141				120			
142							
143				531	103		
144			61	1601	477		
145			203	3782	823		
146				204			
147				299			
148				46			
149				74			
150				1017	219		
151				1270	210		
152				222			
153				267			
154				43			
155				141			
156				184	41		
157			73	2067	409		
158				935	172		
159				680	74		
160				310			
161				170			
162				148			
163			1703	14059	3746		
164			40	916	147		
165			52	1209	143		
166							
167							
168				175			
169				1178	238		
170				206	50		
171				593	66		
172				68			
173							
174				105			
175			42	845	196		
176				525	87		
177				366	41		
178				40			
179				246			
180				49	88		
181				662			
182				256			
183				232			
184							
185				54			
186							
187				439	95		
188				97			
189				861	132		
190				53			
191				43			
192							
193				47			
194			42	1127	145		
195				561	40		
196							
197				82			
198							
199				86			
200				193			
201				205			
202							
203				65			
204							
205				89			
206							
207				667	116		
208				81			
209				117			
210							
211							
212							
213				156			
214							
215				111			
216							
217							
218							
219				118			
220							
221				47			
222							
223							
224							
225				117			
226							
227							
228							
229							
230							
231				54			
232							
233							
234							
235							
236							
237							
238							
239				61			
240							

Silicone Silver
Paint STM K756

Chemical Characterization Summary

Mix Ratio: 150 pbw Resin (I) to 24 pbw Activator (II)
Cure: 4 hrs. at room temperature

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

Silicone Silver Paint STM K756

m/e	Temperature, °K (°C) 298 (25)	548 (275)	623 (350)	723 (450)	823 (550)		
14	433	457	431	487	611		
15	72	86	146	329	681		
16	738	657	709	771	916		
17	1290	1075	1040	1205	1444		
18	3677	2789	2704	3207	3727		
19	296	344	377	474	705		
20					56		
21							
22							
23							
24							
25					48		
26		45	61	93	188		
27				168	356		
28	1441	1409	1549	1964	2695		
29	43	56	84	152	296		
30	151	157	159	197	241		
31							
32	410	418	411	502	600		
33							
34							
35							
36							
37							
38					64		
39					228		
40	182	189	212	268	365		
41		48	55	70	267		
42							
43				62	106		
44	101	108	121	140	191		
45				90	174		
46							
47							
48							
49							
50					40		
51					51		
52					42		
53					47		
54							
55					101		
56					111		
57			41	42	103		
58							
59				64	158		
60							
61					64		
62							
63							
64							
65							
66							
67					43		
68							
69							
70							
71							
72							
73			68	402	994		
74							
75			51	101	151		
76							
77					45		
78							
79					40		
80							
81					73		
82					40		
83							
84							
85							
86							
87					64		
88							
89				47	84		
90							
91							
92							
93							
94							
95							
96			52	177	415		
97							
98							
99							
100							
101							
102							
103				63	135		
104					53		
105					55		
106							
107							
108							
109							
110							
111							
112							
113							
114							
115				44	85		
116							
117					61		
118					42		
119				61	124		
120							
121							
122							
123							
124							
125					41		
126							
127							

Number and Relative Peak Intensity (Continued)

Silicone Silver Paint STM K756

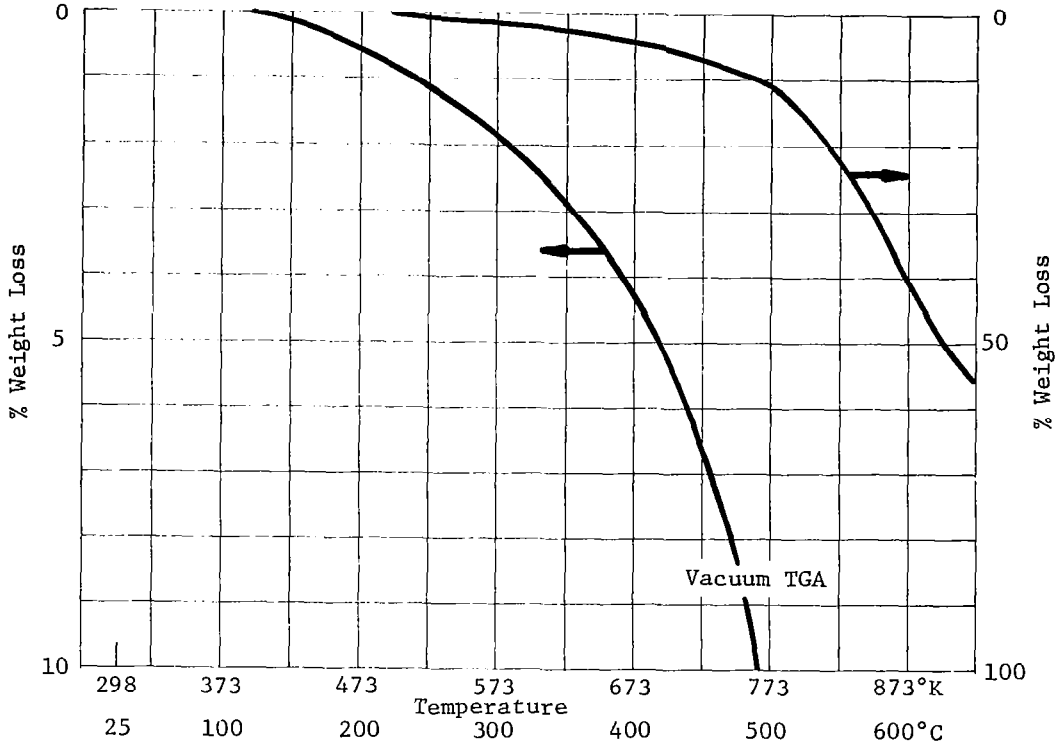
m/e	Temperature, °K (°C) 298 (25)	548 (275)	623 (350)	723 (450)	823 (550)		
128							
129							
130							
131					43		
132							
133			52	171	377		
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147				65	143		
148					48		
149					49		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161					57		
162					43		
163				48	96		
164							
165					52		
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				75	157		
178					68		
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191			52	169	348		
192							
193				107	259		
194							
195							
196					40		
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207		47	318		2526		
208				1142			
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Silicone Sponge
Rubber CHR-R-10470

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 973°K (700°C)

a_o = 58.3% of initial weight

$$k = 2.41 \times 10^2 \exp\left(\frac{-14,100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	9.9×10^6	
373°K (100°C)	5.1×10^5	
423°K (150°C)	5.3×10^4	

Number and Relative Peak Intensity

Temperature, °K (°C)

Silicone Sponge Rubber CHR-R-10470

m/e	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	2060	2819	4534	8039	5637		
15	609	3501	9231	23200	12394		
16	4658	5151	7893	13736	10327		
17	16300	11615	11276	11404	10852		
18	54064	37517	35636	34781	33715		
19	949	1134	1238	936	912		
20	564	605	681	829	801		
21							
22							
23							
24			227	652	166		
25		415	1172	2533	995		
26	271	2470	5763	11946	5100		
27	428	1604	2922	6376	2900		
28	26948	29701	36597	47883	36499		
29	216	924	2045	5132	1927		
30	247	318	444	787	519		
31		57	113	520	147		
32	6348	5172	5189	5401	5292		
33							
34							
35							
36							
37			59	163			
38		57	183	356	57		
39		470	906	1507	511		
40	3191	3394	3976	5020	3788		
41		414	290	600	261		
42		215	173	450	215		
43		274	714	2091	775		
44	542	740	871	1451	1112		
45		679	2646	8978	2892		
46				399	51		
47			359	1331	549		
48							
49				60			
50		89	558	651	79		
51		183	787	928	141		
52		84	465	458	43		
53				81			
54							
55				163			
56							
57				197			
58			45	456	97		
59		339	1630	6064	2045		
60			41	407	60		
61		183	1049	3038	835		
62				102			
63			85	90	45		
64				292			
65			142	422	55		
66			85	259	61		
67				46			
68							
69							
70							
71			41	322			
72			55				
73		2403	10893	48799	14887		
74		150	1175	4698	1327		
75		562	2229	6437	2053		
76			122	387			
77		90	783	1050	267		
78		439	1887	1500	316		
79		56	229	409	603		
80				41			
81		131	822	2195	766		
82		40	297	919	204		
83				139			
84				88			
85				360			
86				58			
87		78	611	2084	552		
88			300	1035	183		
89		227	1151	3154	863		
90				261			
91		89	944	1841	275		
92			57	226			
93							
94							
95							
96		2237	6996	16935	5273		
97		132					
98				116			
99							
100							
101							
102			59	391			
103		314	1428	3493	998		
104			175	736	99		
105			394	1101	220		
106							
107				51			
108							
109							
110							
111							
112							
113							
114							
115		52	536	1537	347		
116				76			
117			176	796	112		
118				179			
119		208	1060	2696	730		
120				176			
121				190			
122							
123							
124							
125				197			
126							
127			147	158			

Number and Relative Peak Intensity (Continued)

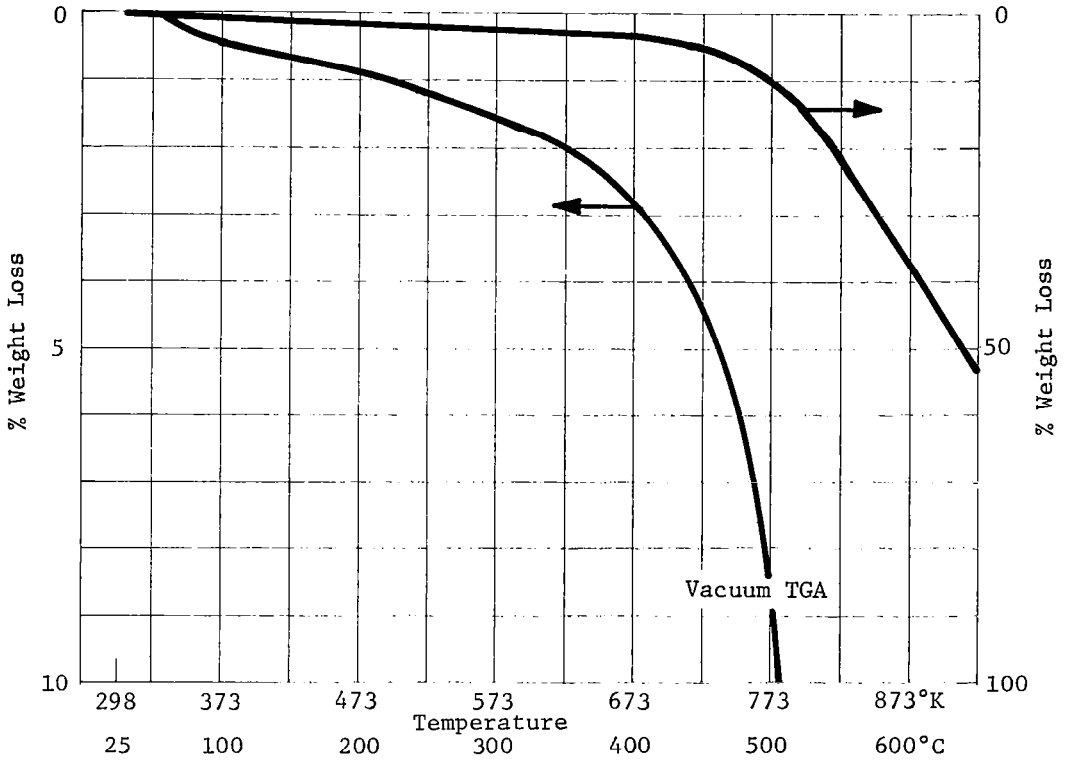
Silicone Sponge Rubber CHR-R-10470

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129			51	98			
130							
131			80	256	48		
132			110	292	61		
133		614	2410	5697	1599		
134			221	726	82		
135			237	811	115		
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			231	1072	169		
148				44			
149				130			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163				158			
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: 48 hrs. at room temperature

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: $403^{o}K$ ($130^{o}C$) - $848^{o}K$ ($575^{o}C$)

a_o = 27% of initial weight

$$k = 6.8 \times 10^{7} \exp\left(\frac{-31{,}500}{1.98\ T^{\circ}K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
$323^{o}K$ ($50^{o}C$)	2.2×10^{13}	
$373^{o}K$ ($100^{o}C$)	3.0×10^{10}	
$423^{o}K$ ($150^{o}C$)	1.9×10^{8}	

Number and Relative Peak Intensity

Temperature, ^{o}K (^{o}C) — Silicone Tape, Series 600

m/e	298 (25)	573 (300)	723 (450)	873 (600)			
14	18557	18560	27687	5137			
15	4437	6218	30219	11883			
16	47685	46820	53064	7680			
17	99567	9645	99621	11267			
18	99569	99621	99617	31376			
19	963	921	943	185			
20	3127	3078	3125	348			
21							
22	44	93	86				
23							
24	53	107	506				
25	157	438	2000				
26	1878	3094	10758	2474			
27	5265	6440	12419	3176			
28	99633	99694	99699	31204			
29	3748	5310	10116	2665			
30	16771	17151	17289	1584			
31	969	2401	4064	513			
32	56033	3050	49405	4516			
33	64	90	104				
34	237	193	209				
35							
36	106	138	295				
37	50	159	763				
38	110	294	1189				
39		979	3492	464			
40	26637	27368	26788	3017			
41	499	1198	2596	238			
42	433	845	1651	120			
43	1072	1649	2824	839			
44	9174	11827	11244	1103			
45	134	360	3125	3953			
46		76	210	87			
47			524	353			
48			181				
49		69	454				
50	83	457	2314	160			
51	80	402	2053	189			
52	58	284	1817	153			
53		102	317				
54		49	152				
55	55	170	373				
56		417	574				
57		72	303				
58		59	262	86			
59			1846	2653			
60			206	97			
61		81	1397	1141			
62			176				
63		89	472				
64		46	85				
65	40	86	176				
66		100	229				
67		41	137				
68			62				
69			48				
70			46				
71			149	53			
72			214				
73			7847	22724			
74		63	1154	2093			
75		65	223	2572			
76		41	392	66			
77		219	1308	188			
78	53	731	5160	710			
79		50	387				
80			61				
81			753	559			
82			429	277			
83			88				
84			43				
85			117	64			
86			52				
87			783	774			
88			502	379			
89			1368	1152			
90			144				
91			257				
92			106				
93							
94		40	86				
95			40				
96		129	8098	7292			
97							
98			90				
99							
100							
101			62				
102			205	76			
103			1646	1468			
104			403	249			
105			513	331			
106			95				
107			49				
108			41				
109							
110							
111			74				
112			46				
113							
114							
115			776	621			
116			95				
117			330	288			
118			136	44			
119			1363	1228			
120			111				
121			128				
122			77				
123							
124							
125			261	108			
126			217	60			
127							

Number and Relative Peak Intensity (Continued)

Temperature, °K (°C)

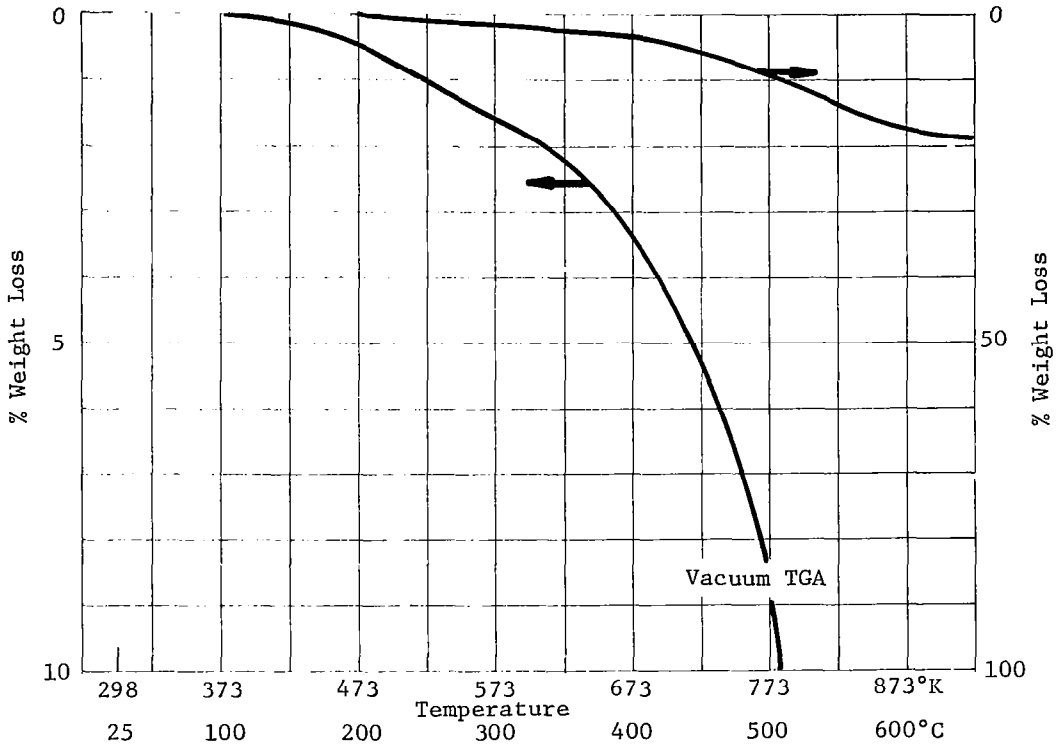
Silicone Tape, Series 600

m/e	298 (25)	573 (300)	723 (450)	873 (600)			
128							
129			71				
130							
131			135				
132	48		209				
133			3360	3434			
134			584	393			
135			313	150			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146			49				
147			527	878			
148'			54				
149				63			
150			133				
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			160	64			
162			58				
163			305	251			
164							
165			42				
166			114				
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			475				
178				366			
179			57				
180			122				
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192			822	727			
193			98				
194			364	366			
195			54				
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208		53	4855	4764			
209			884	835			
210			501	373			
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 598°K (325°C) - 1023°K (750°C)

a_o = 19.5% of initial weight

$$k = 1.0 \times 10^5 \exp\left(\frac{-21,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	2.4×10^9	
373°K (100°C)	2.6×10^7	
423°K (150°C)	8.4×10^5	

Number and Relative Peak Intensity

Temperature, °K (°C)

SV92-RER Silicone Molding

m/e	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
14	1334	1216	1240	1481	1542		
15	348	298	599	1818	2064		
16	2045	1904	2374	4250	3614		
17	8585	7258	7828	14757	6922		
18	31177	25438	28256	53270	23276		
19	63	68			117		
20	70			65	56		
21							
22							
23							
24				46			
25			50				
26	46	201	856	3761	2538		
27	213						
28	19298	18871	20162	23359	20117		
29	591	565	656	808	728		
30	87	74	76	87	72		
31							
32	5254	4683	4352	4078	3709		
33							
34							
35							
36							
37			147				
38							
39			1035	4310	3015		
40	857	755	955		1140		
41	59	52	113	127	162		
42	48		55		112		
43	67	72	64				
44	243	446	1840	2140	1031		
45				101	160		
46							
47							
48							
49			54				
50			1170		3700		
51			1261	6024	3831		
52			1140	5166	3379		
53				741	221		
54							
55				77	82		
56							
57							
58				45	100		
59					141		
60							
61				44	42		
62				51	54		
63			66	848	548		
64				47	45		
65				71	53		
66				43			
67				146			
68							
69							
70							
71							
72							
73					1098		
74			78	887	603		
75							
76			45				
77							
78			4961	19939	12352		
79			95	1247	646		
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91				171	188		
92					69		
93				108			
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105				537	57		
106							
107				63			
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120				47			
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

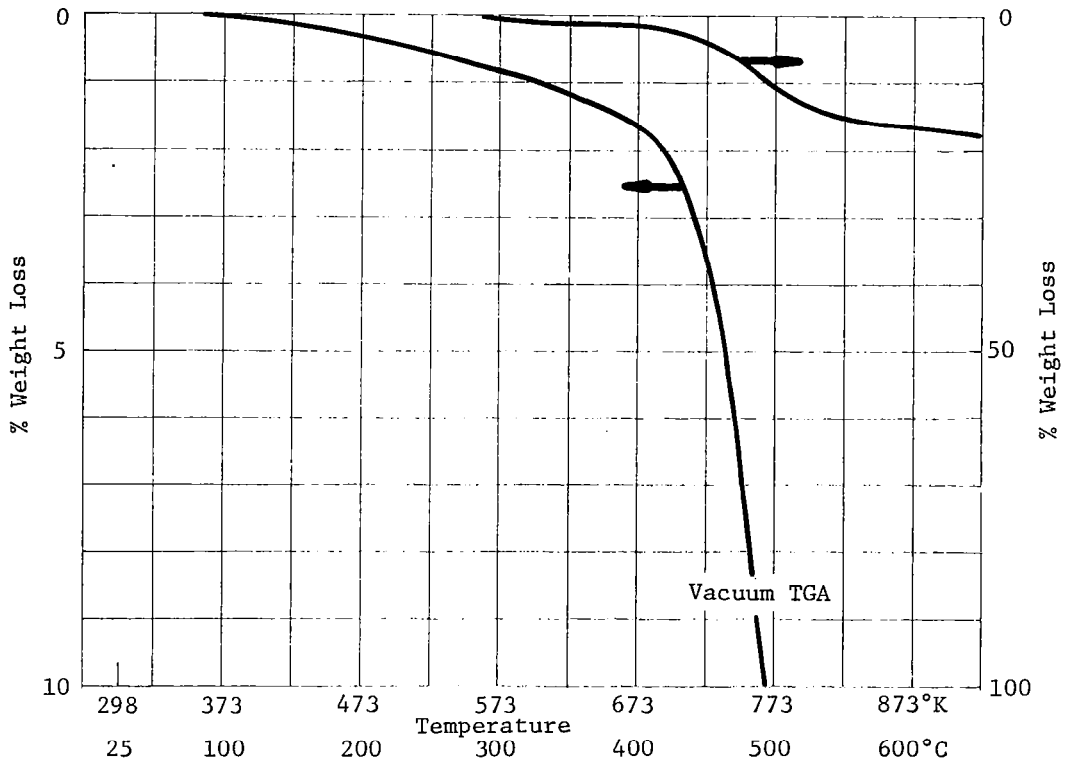
SV92-RER Silicone Molding

m/e	Temperature, °K (°C)						
	298 (25)	473 (200)	673 (400)	773 (500)	923 (650)		
128							
129				57			
130							
131							
132				52			
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163					67		
164							
165							
166				396			
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: 15 min. at 573°K (300°C), 24 hrs. at 548°K (275°C)

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 673°K (400°C) - 1023°K (750°C)

a_o = 18.6% of initial weight

$$k = 1.57 \times 10^{13} \exp\left(\frac{-47,900}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.4×10^{19}	
373°K (100°C)	5.9×10^{14}	
423°K (150°C)	2.7×10^{11}	

Number and Relative Peak Intensity

SV92-RWR Silicone Encapsulant

m/e	Temperature, °K (°C)						
	298 (25)	573 (300)	673 (400)	773 (500)	923 (650)		
14	1526	1414	1621	2812	2839		
15	110	269	734	6232	7571		
16	1954	3526	5632	8454	11286		
17	7850	8199	12341	9375	5806		
18	28433	22060	32841	31756	19067		
19	45		48	81			
20	57		49	66			
21				–			
22							
23							
24							
25	91	44	112		94		
26	152	301	1218	8171	1042		
27							
28	23629	23349	26203	33509	26370		
29	158	232	608	7146	619		
30	51	77	206	911	78		
31			87		54		
32	5795	5191	5156	4630	4081		
33				43			
34							
35							
36			60				
37			96		84		
38		41					
39		41	681	14152	749		
40	465	380	787		535		
41		53	362	7098	203		
42		45			116		
43		46		7855			
44	431	1636	6165		2021		
45		41	41	272	54		
46			45				
47				352			
48			51				
49			50		42		
50			294		449		
51			346	6719	514		
52			216		345		
53			81	4229			
54			53				
55			77	3258			
56			42				
57			51	2824			
58					46		
59							
60							
61			56				
62							
63			66	3151	62		
64							
65			164		52		
66			204	5145	41		
67			41	713			
68			40	264			
69				310			
70							
71				872			
72				94			
73					55		
74			44	739	49		
75				333			
76			46		52		
77				7626			
78		49	847		1747		
79			141	5635	59		
80				1641			
81				257			
82				102			
83				84			
84				360			
85							
86				98			
87				45			
88							
89							
90							
91			46	4644	75		
92				1116	40		
93			111				
94			242	7461			
95				305			
96							
97				44			
98				44			
99				46			
100				43			
101							
102				51			
103				349			
104				227			
105				934			
106							
107			291	11586	47		
108			199	7759			
109				356			
110							
111							
112							
113							
114							
115				92			
116				63			
117				54			
118							
119				72			
120				221			
121				2148			
122			48	3015			
123				98			
124				40			
125							
126							
127							

Number and Relative Peak Intensity (Continued)

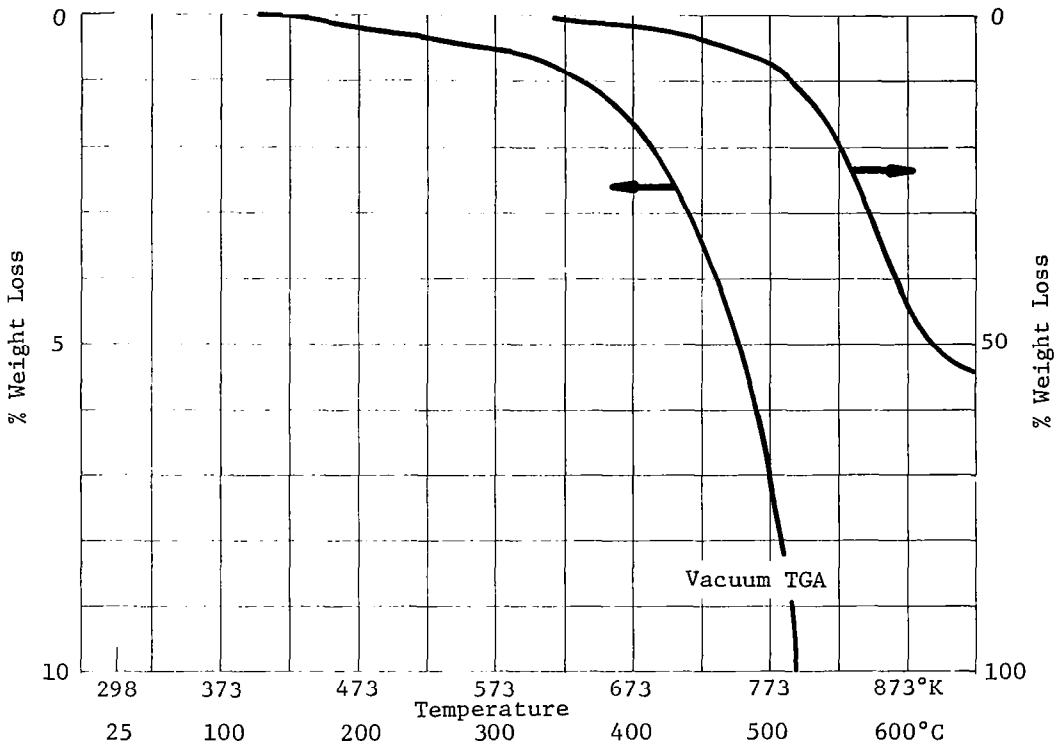
SV92-RWR Silicone Encapsulant

m/e	Temperature, °K (°C) 298 (25)	573 (300)	673 (400)	773 (500)	923 (650)		
128				42			
129				53			
130							
131				127			
132				88			
133							
134							
135				58			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160				393			
161				1350			
162							
163							
164				543			
165				47			
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 923°K (650°C)

a_o = 53.8% of initial weight

$$k = 6.92 \times 10^{7} \exp\left(\frac{-33,100}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.7×10^{14}	
373°K (100°C)	2.6×10^{11}	
423°K (150°C)	1.3×10^{9}	

Isothermal weight loss in nitrogen = 0.07%

Number and Relative Peak Intensity

940-C-1776 Elastomer

m/e	Temperature, °K (°C) 298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
14	2440	2892	7365	8994	4914		
15	907	3003	23942	28834	8708		
16	6304	7003	13812	15093	9798		
17	24199	18270	18002	18523	17137		
18	80312	58399	56124	55330	52088		
19	613	788	948	726	776		
20	680	619	845	884	770		
21							
22							
23							
24		85	618	671	215		
25	78	368	2142	2439	745		
26	451	1812	9785	10959	3481		
27	588	1261	7190	8051	2593		
28	26076	28466	50943	55197	36911		
29	518	1046	7254	7835	1912		
30	610	694	1231	1363	910		
31	88	164	643	741	297		
32	6645	5956	6310	6442	6169		
33							
34							
35							
36	62	84	192	229	160		
37		92	235	187	92		
38	58	105	404	325	198		
39	143	488	1245	1068	628		
40	4316	4642	6411	7168	5747		
41	159	247	787	881	627		
42	121	180	725	826	420		
43	218	400	2643	3050	893		
44	1114	1250	1923	2151	1519		
45	68		7430	8324	1630		
46			443	493	96		
47		75	1457	1736	346		
48			45	75			
49		55	121	108	45		
50	51	360	532	282	162		
51	49	341	609	364	163		
52		288	549	328	111		
53			183	260	112		
54			58	67			
55	44	55	373	474	300		
56	40		126	162	109		
57			400	464	142		
58		47	736	855	157		
59		266	5015	5833	972		
60			543	638	109		
61		203	4539	4971	604		
62			290	320	49		
63		55	338	343	65		
64		48	93				
65	60	48	100	121	106		
66	70	86	469	574	174		
67			174	220	106		
68			47	54			
69			68	110			
70			55	128	163		
71			662	706	93		
72			759	785	107		
73		930	14040	15653	4960		
74		169	2544	2673	571		
75		409	7618	7859	1169		
76		71	638	589	114		
77	43	248	810	690	185		
78		997	1367	518	259		
79		195	266	338	386		
80					48		
81		141	2905	3092	375		
82		73	1712	1826	224		
83			366	343	73		
84	118	132	236	267	182		
85			427	450	53		
86			259	282	58		
87		127	3271	3383	356		
88		64	2080	2054	227		
89		212	5255	5294	609		
90			552	564	59		
91		45	452	467	106		
92			68	57	40		
93							
94				49			
95							
96		1477	30384	30428	3413		
97		148					
98				151			
99			52	51			
100							
101			214	244			
102			976	928	76		
103		250	5899	5722	620		
104		49	1399	1336	138		
105		58	1769	1737	201		
106			179	204			
107			190	173			
108							
109							
110			53				
111			150	101			
112							
113			56	71			
114							
115		104	4802	2601	298		
116			412	386			
117			1296	1222	133		
118			410	367			
119		190	4624	4216	446		
120			524	477			
121			503	438	43		
122							
123							
124							
125			298	182			
126			58	65			
127							

Number and Relative Peak Intensity (Continued)

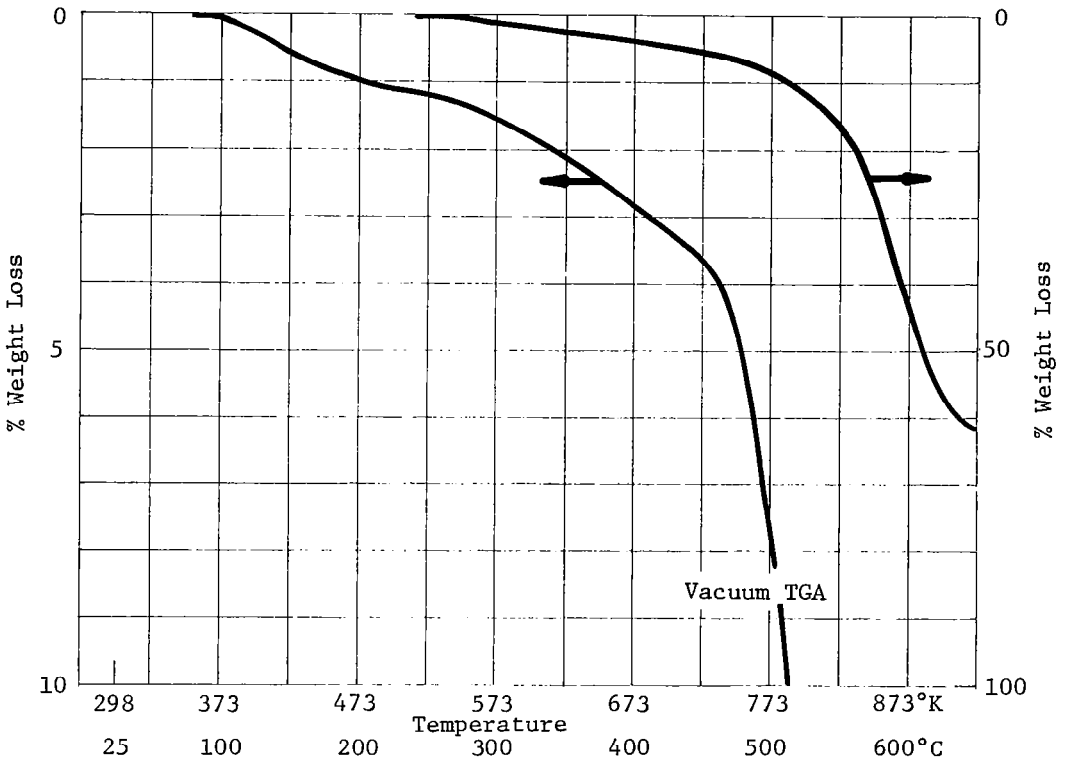
940-C-1776 Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	673 (400)	773 (500)	873 (600)	923 (650)		
128							
129	118	110	253	302	178		
130							
131	78	79	498	498	153		
132	104	111	665	623	178		
133		415	9406	8339	909		
134	41	62	1277	1149	132		
135			812	763	56		
136			98	99	42		
137							
138							
139							
140							
141							
142							
143							
144							
145			63	57			
146			74	72			
147			1234	1168	119		
148			176	166			
149			350	281			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161			222	214			
162			41	47			
163			430	338			
164			47				
165			138	96			
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			241	187			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192			58				
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208			178	92			
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 62.2% of initial weight

$$k = 5.30 \times 10^{7} \exp\left(\frac{-33,700}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	8.4×10^{14}	
373°K (100°C)	7.2×10^{11}	
423°K (150°C)	3.3×10^{9}	

Number and Relative Peak Intensity

Temperature, ^{0}K (^{o}C) — 950-2-1483 Elastomer

m/e	423 (150)	573 (300)	673 (400)	773 (500)	923 (650)		
14	1641	1643	1958	3293	4422		
15	613	745	1487	6448	9348		
16	6730	6552	6783	7026	10648		
17	16406	15198	14484	10627	16138		
18	44779	40711	38147	27182	41320		
19		107	123	139	160		
20	210	187	182	150	244		
21							
22							
23							
24					281		
25		79					
26			650	2573	4217		
27							
28	17775	17670	17815	18525	31252		
29							
30	3179	3131	3088	2392	4014		
31							
32	6441	6256	5973	4368	7423		
33							
34	43	40			53		
35							
36							
37	40						
38							
39							
40	1559	1536	1558	1389	2464		
41	131	145		400	718		
42							
43							
44	1660	1872	1917	2028	3974		
45	48						
46							
47		83	343	570	780		
48							
49							
50	56	64	144	706	556		
51	51	60		690	650		
52		44	99		547		
53							
54	43						
55	52	58	83	150	331		
56	42	53	71				
57				161			
58							
59		41	128	1009	3146		
60			145				
61		56		702	1206		
62			64	240			
63					445		
64	41						
65	46	44	66	283	815		
66	43	41	57				
67			45				
68				55			
69				61	135		
70							
71							
72							
73			198	5723	27133		
74					5693		
75		524	2216	3713			
76							
77	45	91	431	1891	1521		
78	42						
79							
80							
81			45	604	1172		
82							
83							
84							
85					371		
86							
87				738	1608		
88							
89			70	1003	1783		
90							
91		40	80	994	1181		
92			44				
93					1156		
94							
95							
96			239	5526	10882		
97			41				
98							
99							
100							
101							
102							
103			78	1646	2703		
104			46				
105							
106							
107							
108							
109							
110							
111					252		
112							
113							
114							
115			52	929	1536		
116							
117							
118							
119			74	1675	2657		
120							
121							
122							
123							
124							
125			41		700		
126							
127				562			

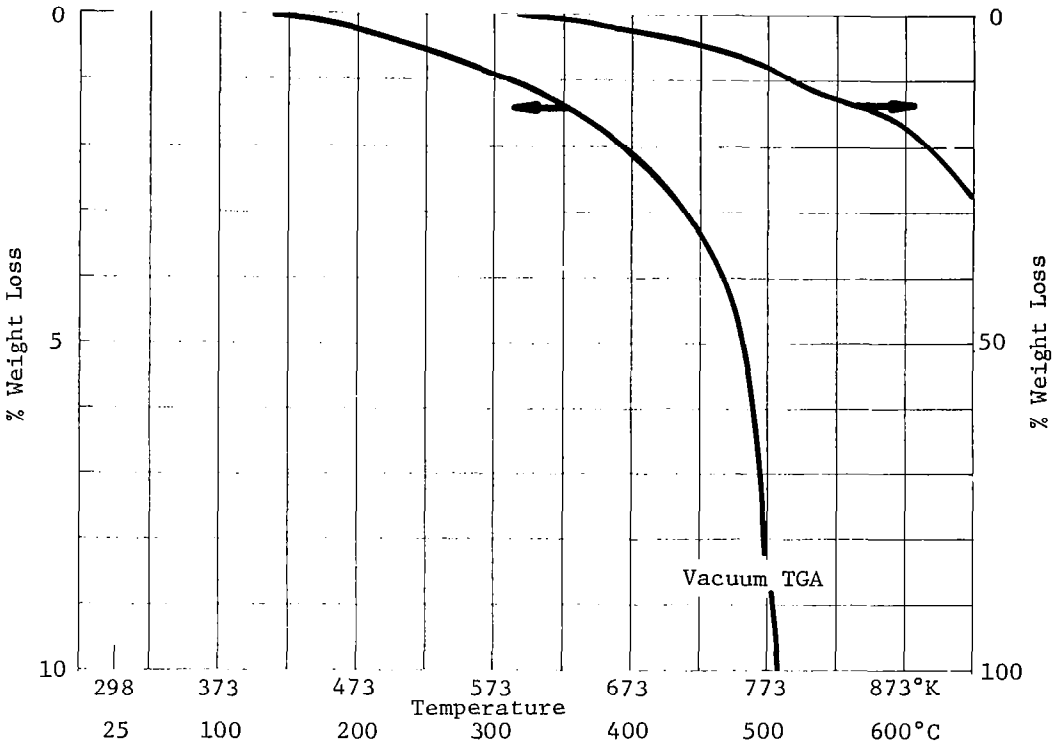
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 423 (150)	573 (300)	673 (400)	773 (500)	923 (650)	950-C-1483 Elastomer	
128							
129	91	93	93				
130							
131	130	126					
132							
133				5429	8688		
134	43	45	231				
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			73	1465	7753		
148			47				
149			43				
150							
151							
152							
153							
154							
155				74	290		
156							
157				84			
158							
159							
160							
161							
162							
163				1386	2028		
164		57					
165							
166							
167							
168				42			
169							
170							
171				44	100		
172					41		
173							
174							
175							
176							
177			93				
178				2315	2867		
179			47				
180							
181							
182							
183							
184							
185					41		
186							
187					40		
188							
189							
190							
191							
192			228	5403	6866		
193							
194							
195			41				
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208		66	1333	36478	46043		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218					40		
219							
220							
221							
222					1116		
223				227			
224							
225							
226				44			
227							
228							
229							
230							
231							
232							
233							
234							
235							
236					178		
237				131			
238				103	156		
239							
240				114			
241				40	41		
249				331			

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 1123°K (850°C)

a_o = 46.2% of initial weight

$$k = 2.33 \times 10^5 \exp\left(\frac{-24{,}800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	1.8×10^{11}	
373°K (100°C)	9.9×10^{8}	
423°K (150°C)	1.9×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C) — 950-C-1569 Elastomer

m/e	473 (200)	623 (350)	723 (450)	823 (550)	923 (650)		
14	1810	1884	2969	3924	5771		
15	821	1141	4449	9081	15733		
16	7986	7656	7754	8485	14678		
17	19127	17582	14353	12656	16431		
18	54240	48891	38271	32686	42297		
19	152	148	139	148	177		
20	273	238	200	194	255		
21							
22							
23							
24			122				
25							
26	298	442	1907	3857	6485		
27							
28	25033	24878	25008	27095	39527		
29							
30	4331	4333	3786	3189	4298		
31							
32	9046	8768	7012	6130	8182		
33							
34	50	56	44	42	64		
35							
36							
37							
38							
39				2179			
40	2342	2295	2060		2961		
41	164	208	364	525	1143		
42							
43							
44	2553	2521	2214	2212	4807		
45	67						
46							
47			99	273	632		
48							
49							
50		137	924	2156	1133		
51	66	123	939	2270	1212		
52	51	98			975		
53		44					
54	44						
55	47	77	114	162	495		
56		63	100	145			
57		42	86	190			
58							
59			323	1187	3704		
60							
61			302	971	2048		
62			205		474		
63		40		454			
64							
65	57	67	140	268	709		
66	44	49					
67		44	57				
68			43	53			
69			46	73			
70							
71			90				
72							
73		84	1560	5602	23666		
74			658	2228	5292		
75		59					
76							
77	67						
78		283	2789	7039	2716		
79		47					
80							
81		44	289	947	2251		
82							
83	40	43					
84			65				
85					424		
86							
87			344	1202	2852		
88		45	455		3339		
89		41		1435			
90							
91		47	204	830	1704		
92							
93				65			
94							
95							
96		188	2732	9715	22336		
97							
98							
99				45			
100							
101							
102							
103		58	679	2148	4706		
104							
105		41					
106			57				
107			42				
108							
109							
110							
111			66	142	363		
112			46				
113							
114							
115			411	1325	2993		
116							
117							
118							
119		56	671	2207	5029		
120							
121							
122				48			
123							
124							
125			168	330	1053		
126							
127							

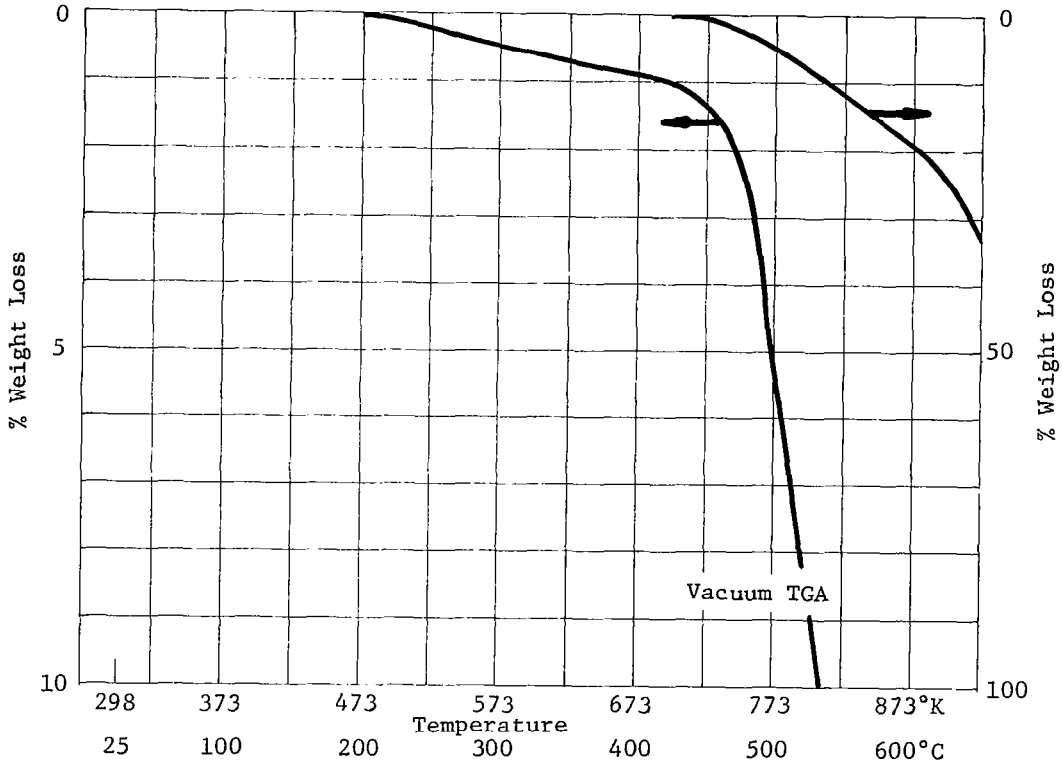
Number and Relative Peak Intensity (Continued)

	Temperature, °K (°C)					950-C-1569 Elastomer	
m/e	473 (200)	623 (350)	723 (450)	823 (550)	923 (650)		
128							
129	113	111	122				
130							
131	154						
132		190					
133			2152	6646	15611		
134	56						
135							
136	49	48					
137				43			
138							
139					58		
140							
141							
142				45			
143							
144							
145							
146							
147		45	492	1595	5792		
148							
149							
150			53				
151							
152							
153							
154				120	322		
155							
156							
157							
158							
159							
160							
161							
162							
163				1547			
164		44	524		3646		
165			246				
166							
167			42				
168			40				
169							
170					62		
171							
172					43		
173							
174							
175							
176							
177		64					
178			878	2486	5722		
179							
180							
181							
182				42			
183							
184							
185							
186							
187							
188							
189							
190							
191							
192		180	2328	6872	13819		
193		85					
194							
195							
196							
197				51			
198					48		
199							
200							
201							
202							
203							
204			76	148			
205							
206							
207							
208		909	14209	41911	97891		
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222					808		
223			72	180			
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236			43	68	223		
237				42			
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 673°K (400°C) - 1023°K (750°C)

a_o = 24.3% of initial weight

$$k = 3.65 \times 10^5 \exp\left(\frac{-24,300}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	5.5×10^{10}	
373°K (100°C)	3.3×10^{8}	
423°K (150°C)	6.8×10^{6}	

Isothermal weight loss in nitrogen = 1.03%

Number and Relative Peak Intensity

Temperature, °K (°C) — 950-C-2491 Elastomer

m/e	623 (350)	723 (450)	823 (550)	923 (650)			
14	986	1524	2270	2731			
15	517	2082	5469	7471			
16	3106	3265	3921	5044			
17	7030	6180	5348	5485			
18	19355	16929	14051	13881			
19	269	304	389	500			
20	216	199	201	199			
21							
22							
23							
24	40	57	131	164			
25	62	164	390	543			
26	253	795	1757	2435			
27	437	736	1515	2145			
28	8577	9511	10736	12048			
29	254	495	1104	1654			
30	867	836	734	795			
31	85	98	130	200			
32	2392	2156	1759	1840			
33							
34							
35							
36	47		50	53			
37			53	60			
38	43	57	80	96			
39	84	143	231	283			
40	1458	1406	1325	1416			
41	84	121	181	228			
42	75	88	127	208			
43	95	130	337	599			
44	623	571	572	649			
45	51	226	868	1545			
46			70	111			
47		52	200	394			
48				40			
49				53			
50	44		47	61			
51			50	64			
52			45	65			
53			43	79			
54				43			
55			51	97			
56				50			
57			54	90			
58			79	148			
59		143	590	1081			
60			74	124			
61		105	390	641			
62			41	62			
63			41	83			
64							
65							
66	42		63	109			
67			40	63			
68							
69							
70							
71			73	110			
72			82				
73	44	546	2648	5617			
74		78	317	636			
75		161	692	1179			
76			66	103			
77			86	195			
78			46	56			
79	40	42	70	70			
80							
81		72	322	705			
82		47	152	243			
83			46	68			
84	54	40	43	49			
85			56	95			
86				54			
87		68	253	439			
88		44	172	271			
89		109	412	723			
90			59	86			
91			57	75			
92							
93							
94							
95							
96	51	545	2175	3610			
97							
98			50				
99							
100							
101				49			
102		109	83	137			
103			463	795			
104			119	190			
105		47	145	243			
106				47			
107				43			
108							
109							
110							
111				46			
112							
113							
114							
115		51	212	359			
116			43	65			
117			114	203			
118			59	81			
119		97	345	590			
120			53	82			
121			50	79			
122							
123							
124							
125			64	92			
126							
127							

Number and Relative Peak Intensity (Continued)

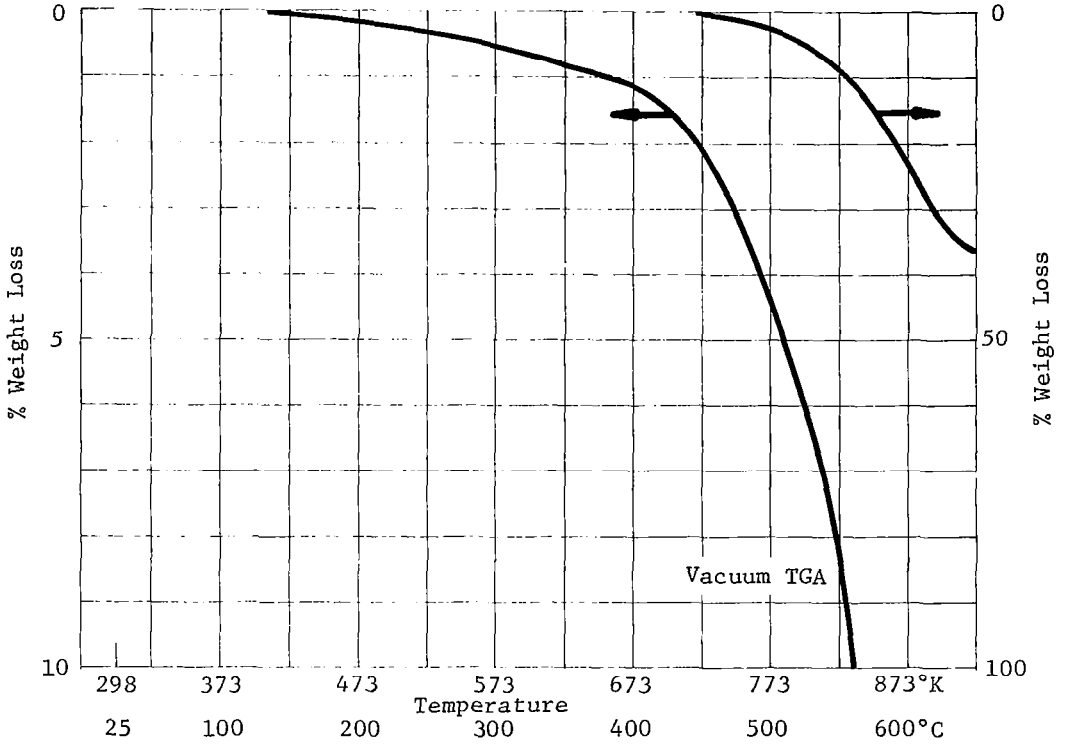
950-C-2491 Elastomer

m/e	Temperature, °K (°C)						
	623 (350)	723 (450)	823 (550)	923 (650)			
128							
129	51		46	50			
130							
131	47		57	85			
132		47	78	95			
133	49	182	737	1222			
134		44	116	187			
135			76	129			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			100	201			
148				46			
149				64			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				48			
162							
163			42	79			
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				42			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 39.8% of initial weight

$$k = 5.76 \times 10^6 \exp\left(\frac{-26{,}400}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	9.8×10^{11}	
373°K (100°C)	3.8×10^{9}	
423°K (150°C)	5.6×10^{7}	

Number and Relative Peak Intensity

960-C-1561 Elastomer

m/e	Temperature, °K (°C) 523 (250)	623 (350)	723 (450)	823 (550)	923 (650)		
14	990	1049	1516	2828	2310		
15	276	425	2189	8377	6214		
16	3364	3291	3707	4765	4110		
17	9962	9377	8930	7181	6190		
18	31429	29549	27579	21728	17811		
19	111	116	117	143	115		
20	152	135	147	126	97		
21							
22							
23							
24			67	188	138		
25	41	57	216	691	482		
26	194	269	956	3091	2012		
27			892	2472	1920		
28	11592	11669	13684	16936	12863		
29	237	272	620	2028	1733		
30	1591	1634	1627	1493	1223		
31							
32	4228	4179	4081	3370	2710		
33							
34							
35							
36			41	66	42		
37			81	232	110		
38							
39							
40	1204	1255	1366	1349	1083		
41	84	104	190	346	267		
42			143				
43							
44	1065	1108	1189				
45	40	53	240	1516	1264		
46			45				
47			58	314	250		
48							
49		48					
50		64	278	885	296		
51		63	291	940	339		
52		57	270	854	279		
53			57	131	94		
54							
55		43	69	133	115		
56		40	54				
57			57	166	140		
58							
59			185	1320	1014		
60							
61			168	1209	855		
62					130		
63			81	277	157		
64							
65			63	202	168		
66			47				
67							
68				51			
69				64	55		
70							
71			51	264	185		
72			743				
73		47		4869	3219		
74							
75			308	2351	1539		
76							
77	44						
78	41	102	998	3699	876		
79			93	306	110		
80							
81			141	1108	633		
82							
83			40		115		
84							
85			43	188	125		
86							
87			158	1441	823		
88							
89			226	1789	1141		
90							
91			71	421	430		
92				109	127		
93				56	53		
94				42			
95							
96		66	1336	12425	6260		
97							
98							
99				47			
100							
101							
102							
103			336	2623	1705		
104			125	940	578		
105			117	837	547		
106				157	103		
107				119	80		
108							
109							
110					41		
111				126	64		
112				80			
113					44		
114							
115			209	1647	1021		
116							
117			120	836	535		
118							
119			339	2786	1653		
120			65	483	285		
121			55	346	203		
122				45			
123							
124							
125			73	286	94		
126					58		
127				54			

Number and Relative Peak Intensity (Continued)

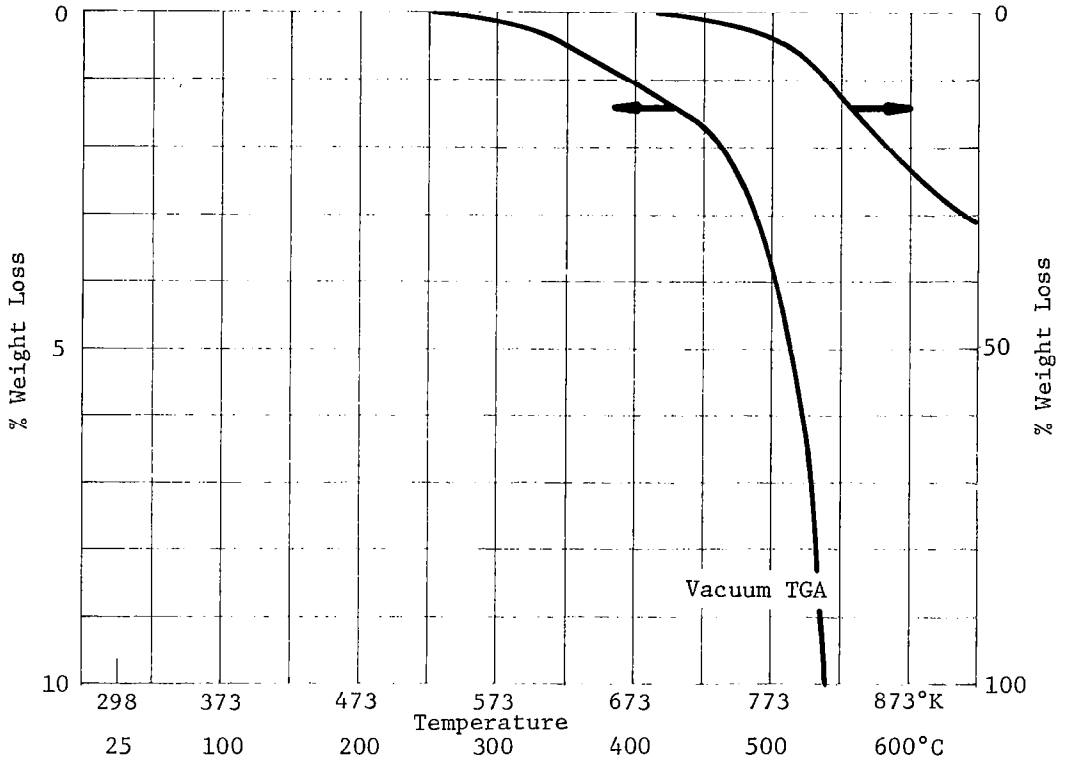
960-C-1561 Elastomer

m/e	Temperature, °K (°C)						
	523 (250)	623 (350)	723 (450)	823 (550)	923 (650)		
128							
129	42	47	56	124	80		
130							
131	45	49					
132	46	53					
133		60	962	8089	4546		
134					823		
135							
136				105	65		
137				44			
138							
139							
140							
141							
142							
143				72	45		
144					48		
145							
146							
147			226	1872	1239		
148			82				
149			94	690	413		
150					91		
151				92	65		
152				42	40		
153				52	41		
154				71	79		
155					41		
156							
157							
158					70		
159				118	78		
160							
161			124	975	511		
162							
163			211	1749	988		
164							
165			99	788	428		
166				164	118		
167					54		
168							
169							
170							
171							
172							
173							
174							
175							
176							
177			345	2876	1476		
178			117	808			
179							
180							
181					41		
182							
183							
184							
185							
186							
187							
188							
189							
190							
191		56	874	6274	3116		
192					1362		
193			412	2792			
194							
195							
196							
197							
198							
199							
200							
201							
202							
203				104	49		
204					42		
205							
206							
207		217	5224	47774	23604		
208							
209			42				
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222				192	104		
223							
224				42			
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235				60			
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 973°K (700°C)

a_o = 32.3% of initial weight

$$k = 5.03 \times 10^5 \exp\left(\frac{-25{,}600}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.9×10^{11}	
373°K (100°C)	1.3×10^{9}	
423°K (150°C)	2.2×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C) — 970-C-1562 Elastomer

m/e	298 (25)	623 (350)	723 (450)	823 (550)	923 (650)		
14	3615	3564	5074	11813	7044		
15	1633	2291	7146	31944	12300		
16	13254	12029	13369	21844	17208		
17	46627	32722	29715	29331	29674		
18	100648	96089	83976	80300	81095		
19	439	551	651	836	736		
20	996	846	846	1004	950		
21							
22							
23							
24			134	881	210		
25	77	137	616	3022	974		
26	686	1025	3200	14185	4626		
27	1357	1431	2447	8804	3505		
28	43870	39565	43256	65453	50829		
29	653	836	1580	6867	2165		
30	2222	2171	2115	2784	2435		
31		218	264	686	382		
32	11087	9056	8501	8541	8743		
33							
34	58			46	43		
35							
36			68	175	125		
37			157	557	110		
38		48	275	800	212		
39	85	197	853	2331	711		
40	7442	7064	7111	8785	8315		
41	123	515	269	824	473		
42	94	97	191	686	355		
43	177	212	380	2363	1078		
44	2922	2541	2540	3091	2769		
45	42	76	784	6736	1892		
46				379	70		
47			117	1409	292		
48				108			
49			99	325	48		
50		80	847	1949	371		
51		88	808	2057	433		
52		59	703	1726	306		
53				210	88		
54							
55				299	130		
56				92	49		
57				315	88		
58				691	156		
59			465	4580	1156		
60				463	97		
61			406	4323	694		
62				333	50		
63			131	593	132		
64	54	45		91	75		
65			54	361	147		
66	78	53	96	531	192		
67				133	62		
68							
69				60			
70				46			
71				535	69		
72				667	92		
73		68	1775	13053	4574		
74			350	2604	576		
75			738	7103	1388		
76			141	802	105		
77		43	625	1794	366		
78		251	2681	5808	1023		
79		59	244	519	127		
80				40			
81			252	2671	449		
82				1711	255		
83				268	51		
84	130	109	117	206	149		
85				355			
86				208	41		
87			213	2785	434		
88			115	1768	237		
89			439	4789	785		
90				507	53		
91			45	1006	336		
92				145	85		
93							
94							
95							
96		125	2725	26457	4423		
97							
98							
99							
100							
101				192			
102				855	85		
103			507	5484	844		
104			84	1260	152		
105			118	1707	228		
106				139			
107				140			
108							
109							
110							
111				102			
112							
113				62			
114							
115			205	2671	395		
116				398			
117			70	1283	144		
118				377			
119			394	4356	639		
120				492			
121				449			
122							
123							
124							
125				267			
126				48			
127							

Number and Relative Peak Intensity (Continued)

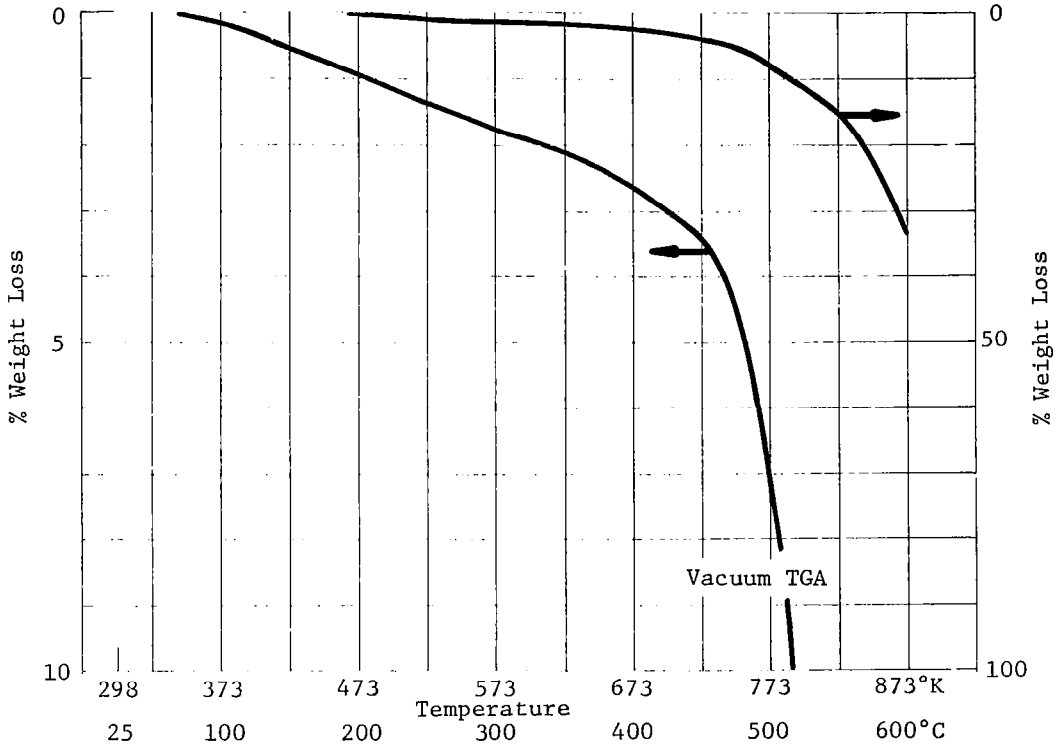
970-C-1562 Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	623 (350)	723 (450)	823 (550)	923 (650)		
128							
129	151	143	147	261	184		
130							
131	121	89	110	465	184		
132	124	117	157	666	196		
133			899	9377	1324		
134			117	1247	168		
135				856	62		
136				76			
137							
138							
139							
140							
141							
142							
143							
144							
145							
146				57			
147			45	1303	199		
148				171			
149				345			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				257			
162							
163				501			
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177				256			
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191				96			
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207				133			
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: Not amenable to analysis

a_o = of initial weight

$k = \exp\left(\frac{-}{1.98\ T°K}\right)\ min^{-1}$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)		
373°K (100°C)		
423°K (150°C)		

Number and Relative Peak Intensity

595-S Elastomer

m/e	Temperature, °K (°C) 298 (25)	373 (100)	573 (300)	723 (450)	823 (550)		
14	701	699	666	997	3685		
15	404	464	2334	1675	13324		
16	2867	2655	13514	2866	6688		
17	17833	16323	48356	12204	11676		
18	63944	58631	59	43324	40645		
19	85	64	169	82	90		
20	143	165		165	203		
21							
22							
23							
24				62	210		
25			48	139	1107		
26	78	112	150	892	5572		
27	116	109	149	404	3587		
28	9539	9626	9197	11084	21473		
29	422	433	512	668	3760		
30	100	94	104	117	320		
31	377	410	519	360	588		
32	2910	2733	2612	2429	2330		
33					42		
34					42		
35							
36				43	59		
37				56	80		
38			48	69	143		
39	42	49	83	192	572		
40	1584	1556	1527	1634	2334		
41		61	68	121	293		
42		42	51	75	217		
43	56	77	81	145	1133		
44	283	367	406	461	816		
45			46	184	3737		
46					161		
47				53	651		
48					54		
49				42	69		
50			61	91	166		
51		44	67	127	222		
52			53	88			
53				40	74		
54					51		
55				45	94		
56				43	57		
57				43	115		
58				40	213		
59				115	2317		
60					152		
61				108	2244		
62				43	93		
63				45	115		
64				42	40		
65				45	86		
66				49	126		
67					54		
68					41		
69					49		
70					43		
71					185		
72					149		
73				381	6251		
74				73	838		
75				99	2895		
76					167		
77			45	59	146		
78			67	201	352		
79				45	55		
80					51		
81				53	742		
82					310		
83					72		
84					51		
85					81		
86					61		
87					670		
88				41	338		
89				52	1142		
90					92		
91					83		
92					40		
93							
94							
95							
96				200	5408		
97					838		
98					63		
99							
100							
101							
102					89		
103				56	591		
104					73		
105					121		
106							
107					40		
108							
109							
110							
111							
112							
113							
114							
115					100		
116							
117					51		
118					41		
119					92		
120					41		
121							
122							
123							
124							
125							
126							
127							

Number and Relative Peak Intensity (Continued)

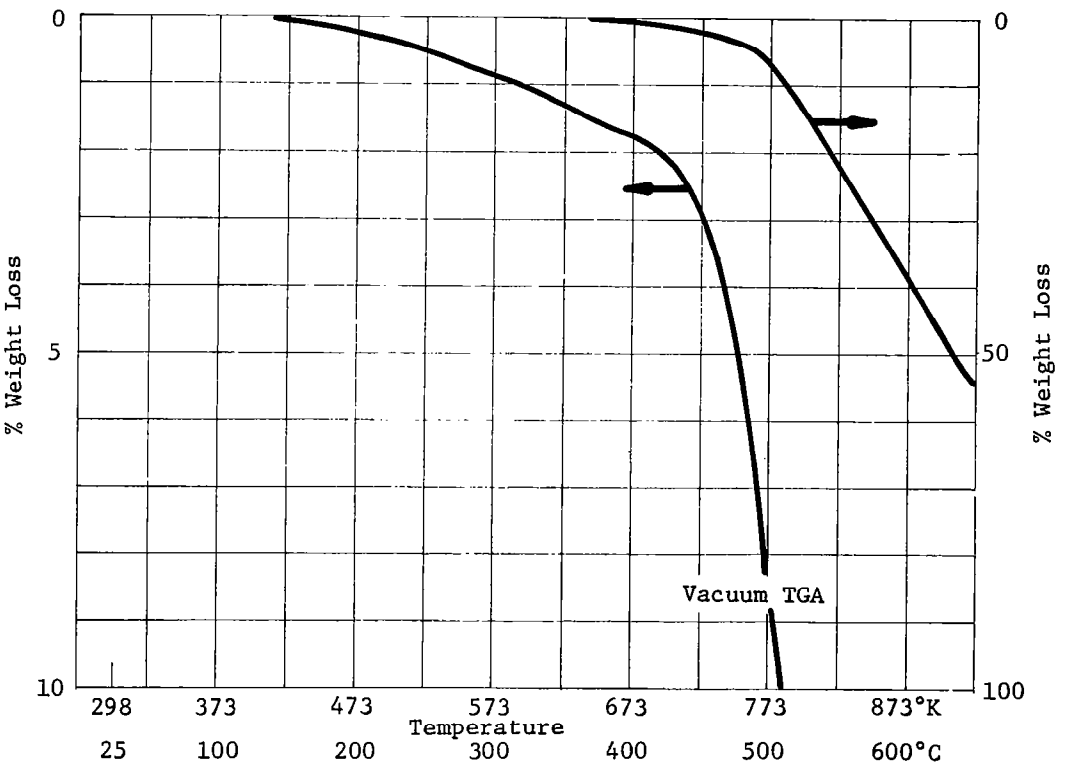
595-S Elastomer

m/e	Temperature, °K (°C)						
	298 (25)	373 (100)	573 (300)	723 (450)	823 (550)		
128							
129							
130							
131							
132							
133					49		
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 1023°K (750°C)

a_o = 61.7% of initial weight

$$k = 4.39 \times 10^{7} \exp\left(\frac{-32,500}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

	Time, sec	
Temp	In Vac	In Nitrogen
323°K (50°C)	1.7×10^{14}	
373°K (100°C)	1.8×10^{11}	
423°K (150°C)	1.0×10^{9}	

Number and Relative Peak Intensity

Temperature, °K (°C) — 11054 Elastomer

m/e	573 (300)	673 (400)	773 (500)	923 (650)			
14	881	989	2098	2489			
15	301	614	4876	6407			
16	2484	2553	3185	4333			
17	6223	5832	4849	5685			
18	18345	17012	13238	15481			
19	77	88	118	109			
20	148	134	122	146			
21							
22							
23							
24			86	98			
25	44	64	228	299			
26	175	272	1108	1381			
27	356	446	1388	1868			
28	7807	7827	8775	11071			
29	187	271	1105	1556			
30	693	710	659	817			
31			100	162			
32	2429	2313	1914	2388			
33							
34							
35							
36			40	41			
37		43	123	96			
38		57	166	149			
39	77	137	423	439			
40	1091	1084	1022	1346			
41	69	96	169	240			
42	56	67	114	171			
43	79	100	339	552			
44	602	622	598	799			
45		72	919	1644			
46			80	111			
47			148	248			
48							
49			81	71			
50		88	351	281			
51		85	338	332			
52		67	281	252			
53			55	75			
54				44			
55			69	98			
56			42	54			
57			75	94			
58			81	148			
59		45	638	1151			
60			81	130			
61		45	373	659			
62			57	72			
63			119	119			
64							
65			71	89			
66			58	88			
67				45			
68							
69							
70							
71			67	113			
72							
73		129	4041	8009			
74		45	471	888			
75		63	723	1329			
76			104	149			
77		57	279	301			
78	40	181	952	704			
79			97	85			
80				44			
81			211	349			
82			124	243			
83			42	64			
84				42			
85			53	98			
86				47			
87			241	412			
88			141	259			
89		41	354	634			
90			58	94			
91			157	287			
92				73			
93							
94							
95							
96		149	1908	3032			
97							
98							
99							
100							
101				50			
102			80	121			
103		44	454	738			
104			114	192			
105			147	253			
106				46			
107				46			
108							
109							
110							
111							
112							
113							
114							
115			215	382			
116			44	74			
117			115	179			
118			50	77			
119			327	589			
120			53	82			
121			50	84			
122							
123							
124							
125			46	78			
126							
127							

Number and Relative Peak Intensity (Continued)

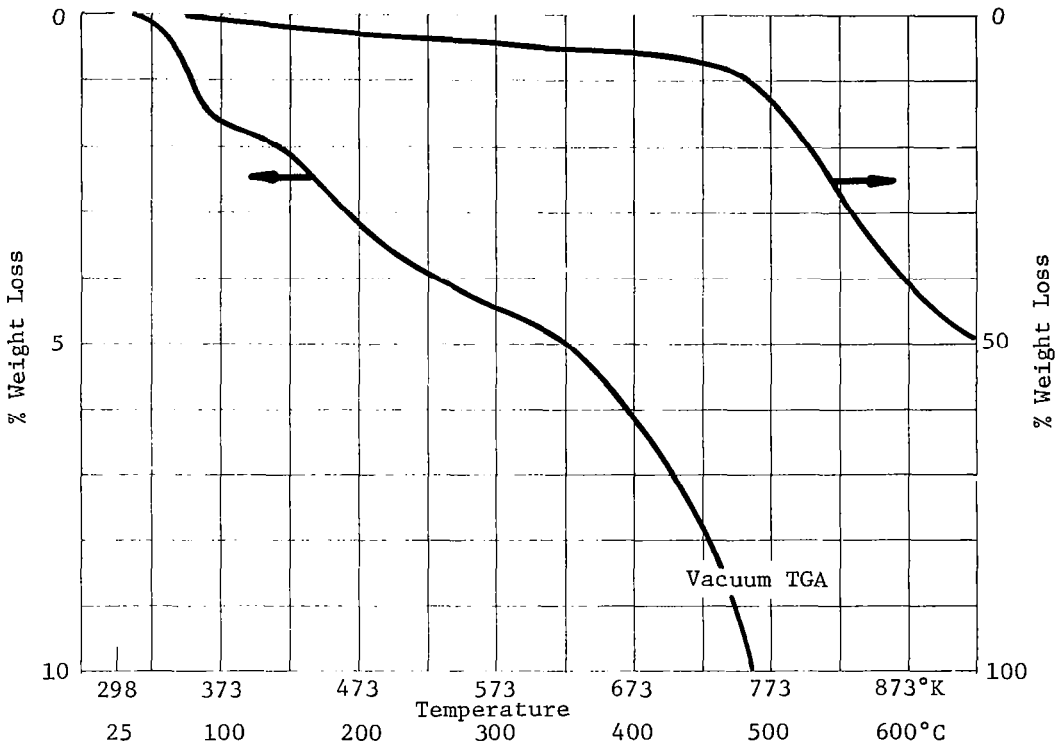
11054 Elastomer

m/e	Temperature, °K (°C) 573 (300)	673 (400)	773 (500)	923 (650)			
128							
129				47			
130							
131			55	78			
132			55	86			
133		60	671	1128			
134			117	173			
135			72	122			
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			115	188			
148'				40			
149			46	63			
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161				40			
162							
163			44	60			
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 623°K (350°C) - 823°K (550°C)

a_o = 19.6% of initial weight

$$k = 4.69 \times 10^{7} \exp\left(\frac{-30,000}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	2.9×10^{12}	
373°K (100°C)	5.4×10^{9}	
423°K (150°C)	4.4×10^{7}	

Number and Relative Peak Intensity

Temperature, °K (°C) — 405290 Elastomer

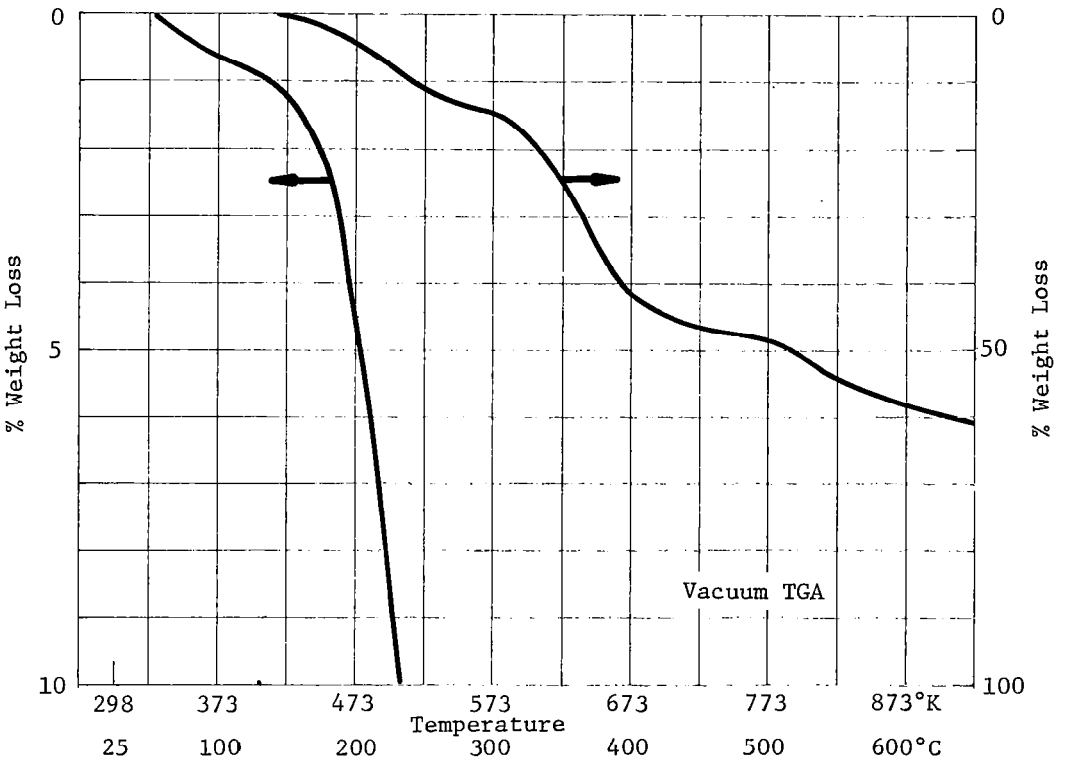
m/e	373 (100)	623 (350)	723 (450)	823 (550)	923 (650)		
14	2711	3096	6013	6656	11683		
15	870	1929	11540	14601	32737		
16	8549	8278	9405	10940	17343		
17	22130	18524	15443	15926	17351		
18	67394	55080	44828	44120	47665		
19	111	131	123	166	178		
20	309	293	292	294	341		
21							
22							
23							
24			101	110	301		
25		74	393	584	1291		
26	467	701	2226	3123	6232		
27	933	1228	2984	4101	8331		
28	24677	24532	25314	28791	38310		
29	479	826	2188	2858	6707		
30	1918	2094	1786	1784	2534		
31	47	232	196	208	593		
32	7791	7384	6014	5967	6754		
33							
34							
35							
36							
37			74	78	168		
38		42	136	155	264		
39	177	293	629	742	1257		
40	3241	3287	2986	3394	4184		
41	123	168	352	473	922		
42	51	82	187	283	593		
43	114	171	532	727	2236		
44	1888	1952	1857	1867	2543		
45		47	1023	1601	7223		
46				48	370		
47			155	260	942		
48							
49					48		
50		64	207	168	216		
51		46	205	183	203		
52			121	140	171		
53				55	163		
54							
55			58	68	64		
56					298		
57				70	122		
58			48	91	539		
59			630	1100	4997		
60			40	71	480		
61			507	872	2738		
62					124		
63				61	149		
64							
65							
66				62	199		
67					71		
68							
69					41		
70							
71			41	72	396		
72			40	84			
73		40	1751	3847	34715		
74			287	510	3665		
75			880	1457	5499		
76			47	71	340		
77			129	183	340		
78		136	454	408	319		
79							
80							
81			292	410	1372		
82			128	219	764		
83					112		
84					63		
85				44	321		
86					77		
87			329	474	1741		
88			158	268	953		
89			561	820	2534		
90				59	225		
91			62	73	221		
92							
93							
94							
95							
96		180	3403	4776	13743		
97				539			
98							
99							
100							
101					105		
102			48	88	448		
103			680	939	3177		
104			90	169	707		
105			145	246	953		
106					58		
107					63		
108							
109							
110					41		
111					70		
112							
113							
114							
115			250	424	1518		
116					179		
117			113	154	731		
118					240		
119			481	710	2469		
120				46	240		
121					248		
122							
123							
124							
125					283		
126					40		
127							

Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 373 (100)	623 (350)	723 (450)	823 (550)	923 (650)	405290 Elastomer	
128							
129					65		
130							
131				42	213		
132			48	71	234		
133			1115	1579	5163		
134			85	155	668		
135			46	77	379		
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147			100	159	699		
148					77		
149					147		
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162					77		
163				45	190		
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: Not available
Cure: 24 hrs. at room temperature, 1 hr. at 350°K (77°C),
4 hrs. at 400°K (127°C)
1. TGA Preconditioning: None



2. Activation Energy of Decomposition:

Over the Range: 373°K (100°C) - 723°K (450°C)

a_o = 47.8% of initial weight

$$k = 1.79 \times 10^2 \exp\left(\frac{-9{,}200}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	5.9×10^3	
373°K (100°C)	8.6×10^2	
423°K (150°C)	2.0×10^2	

Number and Relative Peak Intensity

Temperature, °K (°C) — 7X933 Black Paint

m/e	298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	
14	2497	2648	3155	6546	2947	2770	
15	1309	1629	3188	10729	2466	2400	
16	8146	8085	8295	10104	6345	8230	
17	32640	30134	29528	28432	27190	25478	
18	100246	97577	94886	90930	86423	81165	
19	265	359	778	1641	378	293	
20	853	763	816	871	801	851	
21							
22							
23							
24			112	654	97	129	
25	72	174	591	2500	473	602	
26	588	1244	3203	11907	2880	3670	
27	773	2291	7024	20980	4186	5312	
28	28110	30226	34002	56017	32252	31994	
29	482	3662	7400	31556	3567	2067	
30	787	2364	2113	5578	1313	1058	
31	94	2169	10893	35900	2936	1328	
32	6620	6262	6415	6805	6149	6002	
33		126	505	473			
34							
35							
36		50	70	142	100	179	
37		72	296	714	416	1033	
38	52	162	562	1147	662	1423	
39	174	903	2511	5363	1772	3303	
40	6233	6374	6795	8252	6797	7122	
41	162	2037	6022	8563	1203	1092	
42	118	952	2777	5446	809	603	
43	186	1571	5061	11445	1394	847	
44	1267	1586	2968	10303	2426	1735	
45	55	414	2557	10238	1162	522	
46			659	3918	328	138	
47				237			
48				42		59	
49			97	333	243	673	
50	55	147	561	1352	1517	4121	
51	66	145	465	1197	1337	3937	
52		44	311	869	966	3375	
53		59	174	1434	265	300	
54			74	757	115	100	
55		420	1093	3131	423	279	
56		1915	5767	5412	323	284	
57		168	593	1943	217	102	
58			47	473			
59			303	3304	297	89	
60			42	474	61	64	
61				150	60	148	
62				63	76	182	
63			49	192	279	761	
64	97		86	150	117	173	
65	80	96	93	350	180	216	
66	116	115	117	476	191	194	
67			43	396	116	192	
68			46	504	86	80	
69			67	1078	112	50	
70			41	411	42		
71				1083	94		
72			182	544		49	
73			105	345	113	279	
74			90	209	263	806	
75				106	261	424	
76				166	944	1254	
77		52	237	474	763	2640	
78	43	58	896	1202	2695	11849	
79			45	247	205	759	
80			41	59			
81				615	67		
82				407	82	71	
83			41	844	99	54	
84	196	220	240	813	272	263	
85			43	583	51		
86		41		173	61	49	
87				54			
88				119			
89							
90							
91			46	266	158	260	
92				136	100	174	
93							
94				63			
95				154			
96				153			
97				750			
98				133			
99				329			
100				43			
101				46			
102							
103				120	1237	1041	
104					79	74	
105				64			
106							
107							
108							
109				57			
110				87			
111				148			
112				124			
113				120			
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125				93			
126							
127							

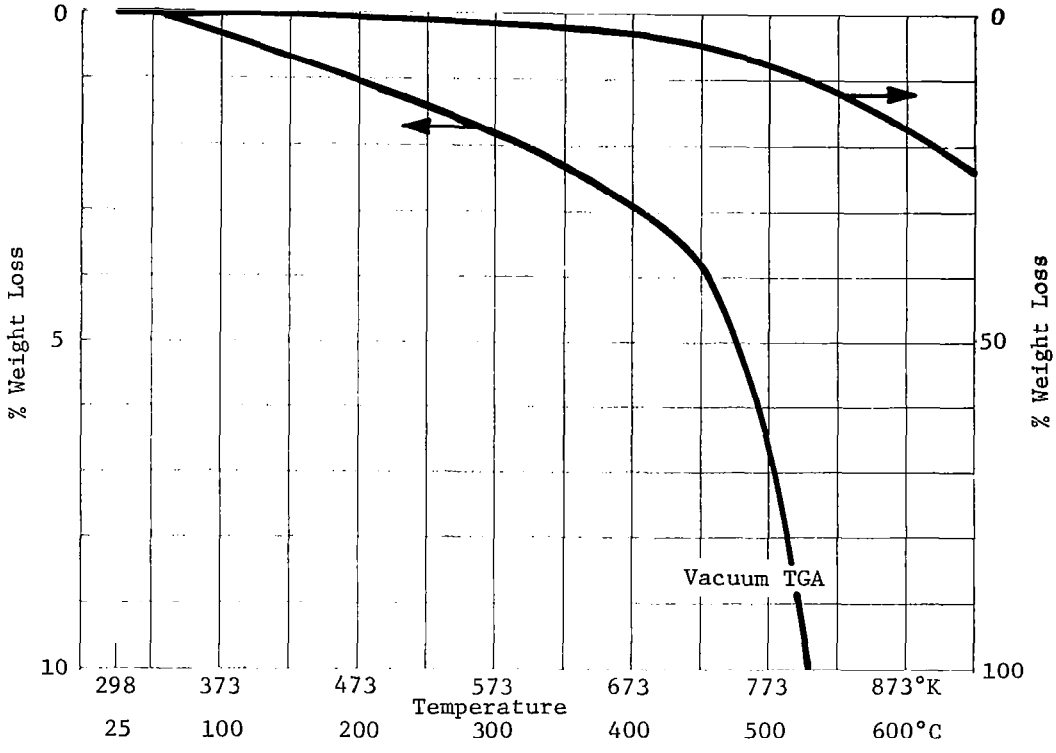
Number and Relative Peak Intensity (Continued)

m/e	Temperature, °K (°C) 298 (25)	423 (150)	523 (250)	623 (350)	723 (450)	823 (550)	7X933 Black Paint
128							
129	209	186	194	229	206	237	
130							
131	120	121	112	140	154	157	
132	180	160	175	198	174	206	
133							
134		40	45	54		45	
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							

Chemical Characterization Summary

Mix Ratio: As Received
Cure: As Received

1. TGA Preconditioning: 24 hrs. at 296°K (23°C) and 45% RH



2. Activation Energy of Decomposition:

Over the Range: 573°K (300°C) - 873°K (600°C)

a_o = 16% of initial weight

$$k = 1.1 \times 10^6 \exp\left(\frac{-24{,}800}{1.98\ T°K}\right)\ min^{-1}$$

Time to 1% Weight Loss at Temperature T

Temp	Time, sec	
	In Vac	In Nitrogen
323°K (50°C)	4.0×10^{10}	
373°K (100°C)	2.1×10^{8}	
423°K (150°C)	4.0×10^{6}	

Number and Relative Peak Intensity

Temperature, °K (°C)

ZP5044 Silicone Elastomer

m/e	298 (25)	573 (300)	773 (500)	923 (650)	1073 (800)		
14	630	1129	1617	1760	1819		
15	205	306	2082	4926	6995		
16	1258	1036	2710	4108	9751		
17	5940	5595	5524	4901	5476		
18	17315	25336	16651	18874	19936		
19	259	321	770	874	1905		
20	291	415	439	502	514		
21							
22							
23							
24		76	81	259	70		
25	65	185	440	852	245		
26	388	657	2476	4344	1700		
27	541	913	1591	3541	1751		
28	23460	5336	36876	39920	39183		
29	635	946	1452	2870	1355		
30	305	556	422	756	697		
31	340	397	310	488	456		
32	4151	6013	5097	5164	5529		
33							
34							
35							
36	47	42	59	52			
37		47	173	181	122		
38	46	72	273	230	208		
39	113	229	851	990	971		
40	2183	3395	3083	3765	4105		
41	158	256	294	701	1396		
42	109	128	197	432	243		
43	429	649	747	1324	646		
44	723	1000	933	1508	2411		
45	71	58	895	2499	115		
46			47	110			
47			216	529	129		
48							
49			136	119	47		
50		55	680	386	177		
51	48	77	603	399	159		
52	41	42	407	410	60		
53			52	135	76		
54							
55		40	44	125	159		
56	47	51		58	194		
57	42	71	41	96	43		
58			59	233			
59			413	1238			
60			46	103			
61			299	1064			
62			44	56			
63			96	143			
64							
65			62	81			
66			40	68			
67				47			
68							
69	93	69	40	60	62		
70							
71				91			
72		49	50	116			
73			1428	2339	44		
74			229	350			
75			292	1035			
76			61	84			
77			162	196	42		
78			710	295			
79			59	46			
80							
81			79	325	86		
82				122			
83							
84							
85				54			
86							
87			76	230			
88				138			
89			43	262			
90							
91				119			
92							
93							
94							
95				82			
96			298	1146			
97			43	196			
98							
99							
100							
101							
102							
103				103			
104							
105				44			
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
CR-3588		

4. Title and Subtitle	5. Report Date
Nonmetallic Materials Handbook Volume 2 - Epoxy and Silicone Materials	July 1982
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Stanley E. Podlaseck	
	10. Work Unit No.
9. Performing Organization Name and Address	
Stanley E. Podlaseck 156 Oakmont Avenue Lompoc, CA 93436	11. Contract or Grant No. NAS1-15133
	13. Type of Report and Period Covered Contractor Report
12. Sponsoring Agency Name and Address	
National Aeronautics & Space Administration Washington, DC 20546	14. Sponsoring Agency Code

15. Supplementary Notes

Langley Technical Monitor; Robert T. Magee
Topical Report

16. Abstract

This document contains thermochemical and other properties data on the following types of epoxy and silicone materials: adhesives, elastomers, potting compounds and encapsulants, coatings, finishes, inks, laminates, lubricants, sealants, and tapes. This document is one of three volumes covering epoxy materials and silicone materials.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Thermogravimetric analysis; insitu tests; thermal stability/degradation/vacuum tests; mass spectra; degassing; contamination; degradation predictions	Unclassified-Unlimited Subject Category 27

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	307	A14

For sale by the National Technical Information Service, Springfield, Virginia 22161

NASA-Langley, 1982